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1817
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Capt. Hull.
Springfield.
Chelmsford

J. M. Downing



H. Knight ad nat.

West, Newman & Co. chromo.

The Genus *Lycæna*.

6

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POPE's '*Homer*.'

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1887.

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"All things in common Nature should produce,
Without sweat or endeavour ; * * *
* * * * Nature should bring forth,
Of its own kind, all foison, all abundance."

'*Tempest*,' Act 2, Scene i.

"Such, said Adoam, are the sentiments of this sagacious people, who have
acquired wisdom only by the study of Nature."—'*Telemachus*,' Book viii.

YASQU
XOPAL. OROBATE CH. AL
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NOTES ON THE GENUS *LYCÆNA*.

By RICHARD SOUTH, F.E.S.

(PLATE I.)

THE well-known tendency to variation exhibited by certain species of *Lycæna* has marked them out as the particular quest of the "variety hunter." I have myself given many hours to the examination of such species as *L. icarus* and *L. corydon* in their natural haunts. My object, however, was not so much the acquisition of extraordinary forms as a desire to obtain a knowledge, as far as this was practicable, of the whole range in the variation of these species in particular South of England localities. I need hardly say that, with such purpose in view, capture with the net would have either entailed a considerable expenditure of time or necessitated wholesale slaughter of "the innocents." As I could not afford the one and was unwilling to effect the other, a line of operation was adopted, which though sometimes difficult to conduct,* was nevertheless attended with very satisfactory results.

Having first ascertained the best places for work, *i. e.*, places where the species were most numerous, these were visited on dull days, or after 5 p.m., when the insects were either asleep or preparing for sleep. Working against the wind, all examples of *icarus* or *corydon* that could be got hold of were examined, and the required aberrations "pill-boxed," the rejected ones being cast to

* As, for instance, when the butterflies rested on the herbage growing on steep slopes, such as those below Beachy Head at Eastbourne.

the rear, so that the chance of an individual coming a second time under observation, at least on the same day, was reduced to a minimum. As the under surface of the hind wings only was visible while the insects were at rest, it was found necessary to take each specimen between the finger and thumb of the right hand, seizing the closed wings gently, but firmly, near their base, and then quickly secure its body with thumb and index finger of the left hand, when the upper as well as the under side could be readily examined. Treated in this way neither the specimens retained or those restored to liberty need sustain any appreciable damage, if their apprehension is deftly executed.

With *Lycæna corydon*, at Ventnor in 1883 and Eastbourne in 1886, I was especially successful, and obtained a most interesting series of this species in each locality, among which are specimens representing the principal varietal forms found in the "blues." I will therefore commence my observations on the genus *Lycæna* by some remarks on the aberration of *corydon* in Britain, as far at least as I am acquainted with it. Subsequently I propose to consider—1, the variation of *L. icarus* and *L. bellargus*, as observed in this country; 2, local European species of *Lycæna* allied to *icarus*, *corydon*, and *bellargus*, and forms of the latter occurring in other parts of the Palæarctic region.

Lycæna corydon, Poda.

UPPER SURFACE.

Male.—Although the coloration of the upper surface of male *corydon* seems to be fairly uniform in England, still certain slight differences in the matter of tint are to be observed when series from widely distant localities, such for instance as Eastbourne and Newmarket, are placed side by side. In the black hind-marginal border of the fore wing, however, we have a more variable feature. Referring to my specimens from Eastbourne and Ventnor, I find several from each locality with very wide black borders to the fore wings, and others in which this border is very narrow. One example from the former locality has the border so exceedingly narrow that it may be justly termed linear. Several examples exhibit indications of a row of ocelli on the hind margin, but in two specimens from Eastbourne these ocelli are quite distinct, though the whitish rings are not clearly outlined. In number there are six, or seven if the

double one near the anal angle be counted as two, of these ocelli.* (Fig. 9, Plate I, represents this form.) The black border on hind margin of inferior wings is generally ill-defined, often narrow and external to the ocelli, but sometimes it is broad and obscures the eye-spots. The ocelli in this wing are seven in number (two at anal angle close together), but only the outer halves of the white rings are clearly expressed, the inner halves being more or less invaded by the blue ground colour. The fringes are not by any means constant; for although the majority of individuals of this sex of *corydon* have the fringes plainly chequered with black and white, in many examples this character is so faintly exhibited that the fringes appear simply white. Careful examination, however, of the cilia of such specimens reveals the fact that in most of them vestiges of the black still remain.

Female.—The normal coloration of female *corydon* is, according to Dr. Lang,† “brown, with a black discoidal spot on the fore wings; all the wings with the usual hind-marginal orange band, which is pale in colour.” So far as I have observed this sex of *corydon* in various parts of England, I have not yet seen a specimen in which the orange marking of the hind-margins of the wings assumed band-like proportions. In the majority of specimens I have seen the orange marking is confined almost entirely to the inferior wings, where it appears in the shape of crescents, which are deep and not pale in colour. When these crescents are present on the fore wings they are pale, and often very obscure. One or two examples in my Eastbourne series have only the least possible trace of orange-colour, even on the hind wings. In all cases each of these orange crescents forms the internal half of a ring surrounding a black spot; the external half of the wing is generally white, but sometimes suffused with a brownish tint. When the orange is absent from the fore wings, so also are the black spots; but in the examples, previously adverted to, from the hind wings of which the orange has nearly gone, the black spots still remain. Then as to the discoidal spot on fore wings. In some examples this is difficult to discover,

* I have not many examples of *corydon* from the Newmarket district, but in those I have I find ocelli and distinct traces of crescents on the fore wings of the male, which in two examples are as clearly defined as in female specimens from the same locality. In neither sex are these crescents orange in colour, but whitish in the male and a pale fawn in female.

† ‘Butterflies of Europe.’

whilst in others it is surrounded with white or pale blue scales, and consequently very distinct. Many specimens have a discoidal spot on the hind wings also, and these too are sometimes encircled with blue scales; but in the majority no trace of any such spot is to be found on the inferior wings, even when searched for with a strong magnifier. Among the *corydon* collected at Ventnor are twenty specimens similar, as regards the discoidal spot, to the example represented, Plate I., fig. 11. Only three, however, of these are exactly identical in the character of the hind-marginal markings of the specimen figured, though several of them are but slightly modified therefrom. The fringes of all the wings in this sex are chequered brown and white, rather than black and white, as in the male. Further, the white sometimes gives place to a pale brown tint, but the chequered character is retained.* As is probably well known, the females of several species of *Lycæna* assume, more or less constantly and in greater or lesser degree, the coloration of the male. As regards female *corydon*, the most highly specialised development of this aberration is var. *syngrapha*, Kef. Although I have not seen any British example quite like Keferstein's variety, as figured by Dr. Lang,† there may be such in the collections of British entomologists. The nearest approach to it I have yet obtained is figured, Pl. I., fig. 12. Other specimens, taken with this example at Ventnor, exhibit the male colour, either on all the wings, or on some of them. Thus, one has sundry dashes of blue towards the hind margin of left inferior wing only; three others are suffused with blue at the base, and have a series of blue triangular dashes internal to the orange crescents on the hind wings; whilst a fifth has a longitudinal streak of blue along the inner margin of left primary, in addition to triangular dashes on inferior wings.

UNDER SIDE.

Male and female *corydon* are not normally alike in the colour of their under surfaces. In the first the fore wings are whitish

* The only female specimen differing from the type in this respect, which has come under my notice, is an example from Folkestone. This is slaty brown, with very indistinct orange markings and white fringes, in which the unassisted eye fails to detect the slightest trace of brown. Under a strong glass minute patches of brown are seen towards the tips of the cilia. Altogether this insect seems to resemble *L. icarus* on the upper side, but the markings of its under side are those of typical female *corydon*. It is probably a hybrid.

† 'Butterflies of Europe,' Pl. XXVI., fig. 7.

or whitish grey, and the hind wings light brown or greyish brown; whilst in the latter the fore wings are light brown, and the hind wings a slightly darker shade of the same colour. The spots in both sexes are the same in number, and similarly disposed in their respective types. As a rule, in descriptions of species of *Lycæna* the basal, discoidal, and central series of spots only are referred to as ocelli; but, though smaller, those on the hind margins of the wings are of exactly the same character, *i. e.*, they are white disks with black centres; and in the following remarks they will be considered as ocelli also. The normal arrangement of the ocelli on the under side of *corydon* is as follows:—Fore wing: Two basal, one discoidal, and seven external to this, forming a more or less curved row; beyond these again are seven on the hind margin, each preceded by a blackish crescent. As the last two ocelli of this series are always small and sometimes faint the apparent number is five only. Hind wing: Four basal, one discoidal, and beyond this seven or—as the last of the series is often a double one—eight, forming a somewhat irregular curve; on the hind margins are six ocelli, bordered internally with orange, black and white crescents, or triangular marks; a white triangular dash has its base on the fourth, sometimes extending to third, hind marginal ocellus, and its apex between the fourth and sixth ocelli of central series. All the ocelli, both as regards shape and size, as well as position, vary exceedingly; but it is unnecessary to enter into any lengthy disquisition upon the whole scheme of deviation in this or that direction from the normal type. At the same time there are three leading types of variation, which deserve full consideration. These for convenience may be styled the obsolete, increscent, and confluent phases of under side aberration.

Figure 1, Plate I., represents an extreme example of the obsolete type from Eastbourne. Between it and the normal type are many individuals from the same locality; showing various modifications as regards number of ocelli, some of which are represented by figs. 2, 3, 4, Pl. I. In what I should say is the initial stage of this form of aberration one of the basal ocelli of fore wings, generally the lower, is absent; next both basal ocelli have vanished; then the first four of the central series disappear one by one; and connected with this last is usually a decrease in the number of ocelli on hind wings.

Among the specimens from Ventnor are examples with but one or two ocelli, sometimes only the discoidal, on the fore wings, whilst nearly all the ocelli are present on the hind wings. In other specimens from the same locality the inferior pair are without any spots other than the discoidal, and the ocellated character of the primaries is almost normal. Again, the right pair of wings in some few individuals differ from the left pair in their respective number of ocelli.

Belonging to the obsolete form of aberration are three specimens received from Folkestone, one of which is shown, Plate I., fig. 5. The character of the central series of ocelli in these specimens is curious, and I can only find two examples among the Eastbourne *corydon* which at all approach it.

Departure from the normal type, in a direction quite opposite to the last, is shown in an example from Eastbourne (Plate I., fig. 7). This is a good illustration of the increscent type of aberration. As will be seen, the spots on the fore wings are not only very bold, but the basal pair are much enlarged, and exhibit a disposition to geminate, whilst a third basal spot is in evidence between them. In many other specimens from Eastbourne and a few from Ventnor each basal spot has become completely divided, so that these examples have each four distinct basal ocelli; and one of the Eastbourne specimens has also an additional ocellus, near the costa, on each fore wing, which increases the number of eye-spots of the central series to eight.

Another Eastbourne specimen (Plate I., fig. 8) represents what I am inclined to consider as probably the incipient stage of a rather uncommon aberration, known among collectors of "blues" as the "splashed" or "streaked" var. In well-marked examples of this variety the spots forming the central row are cuneiform. Modifications of this form are, however, of not infrequent occurrence; thus for instance, among others, is an example from Eastbourne, which has the fifth spot only of the central series wedge-shaped, and in several specimens from Ventnor the outer edge of discoidal spot on fore wings is projected towards the second and third ocelli of central row, whilst these two spots have each a minute dot immediately in front of them.

Of the confluent form (Plate I., fig. 6) I obtained many examples at Ventnor and a few at Eastbourne. On referring to the figure it will be seen that the lower basal spot and the sixth

and seventh of the central series unite and form a thick curved bar. The intermediate stages in the development of this variety are, in my opinion, clearly shown in other Ventnor specimens. Thus in four examples the sixth spot of central row and the lower basal spot are elongated; the internal edge of the former and the external edge of the latter approximating. Representing the next step are specimens in which the sixth central and lower basal spots are united, whilst below them and in close proximity is the seventh spot on one side and an extra basal spot on the other. These two last sometimes coalesce with the compound spot of the second stage, and form the aberration figured; or they may show a tendency, as exemplified by another specimen, to effect an independent junction below the united basal and sixth central spots. On the hind wings the first spots of the basal and central series are generally well separated, but I have seen specimens of *corydon* in which they are united. Among the individuals in my collection I have no representative of this aberration, but in one or two examples the spots referred to are contiguous, and in others the initial spot of central row is elongated, as shown in left wing of fig. 4, Plate I. Among some under side varieties of *corydon*, sent me from Folkestone, are two examples, male and female, in each of which the third basal and two last spots of central series on hind wings are united and form a curved bar. In the arrangement of the other ocelli these specimens are identical. Plate I., fig. 10, represents the female.

At Ventnor the confluent aberration was more frequently met with than either of the other varietal forms, while at Eastbourne the increscent variety was in the ascendant; but in the latter locality the dominant varietal form was in greater proportion to the normal type than at Ventnor. At neither place were examples of the obsolete form often obtained beyond the second stage.* Placed by itself such an example as that represented, Plate I., fig. 1, would probably be considered as *lusus naturæ*, but when connected by intermediate forms with the normal type there can be no doubt that it is a naturally developed form. If aberrations from a given type were accidental, is it probable that any two individuals, even, would exhibit exactly the same degree of variation? Or to consider the question in another way: If an

* That in which both basal ocelli of fore wings are absent.

extreme aberration is accidental, are the intermediate and connecting links obtained at the same time and place also accidental? I believe not; it appears to me that the last cannot reasonably be so considered, therefore neither can the first, because it is certainly a development of the latter.

Another interesting line of enquiry suggests itself:—Suppose it were possible to separate and completely cut off either the obsolete, increscent, or confluent forms from all intercourse with the type or other forms, what would be the result? It is not possible, for obvious reasons, to say what would ensue; but as it seems fairly certain that all the forms are reproduced year after year, even whilst associated with the type, it may be inferred that the form of aberration, possessed in different degrees by each of the individuals belonging to an isolated group, would become specialised. For instance, if all specimens exhibiting a tendency to confluency were removed apart, then a race having the characteristics of the most highly developed aberration would probably be established.

Under existing circumstances the pairing of males and females of similar aberrant forms is quite a matter of chance, but I should suppose that such unions are sometimes effected. Although the offspring of a well-matched pair of aberrations would be likely to consist of a larger proportion of individuals of the parent form, still a fair number of the descendants of a typical male and aberrant female would be found to favour the female parent. The progeny of an aberrant male and typical female would probably for the most part inherit the characters of the female parent, and I think it possible that the under-surface aberrations known as "odd-sided vars." are due to the union of such ill-assorted couples. It will, however, be more convenient to postpone the further consideration of these matters until the variation of *L. icarus* and *L. corydon* has been referred to and certain allied species dealt with, when the whole subject can be more fully entered upon and discussed.

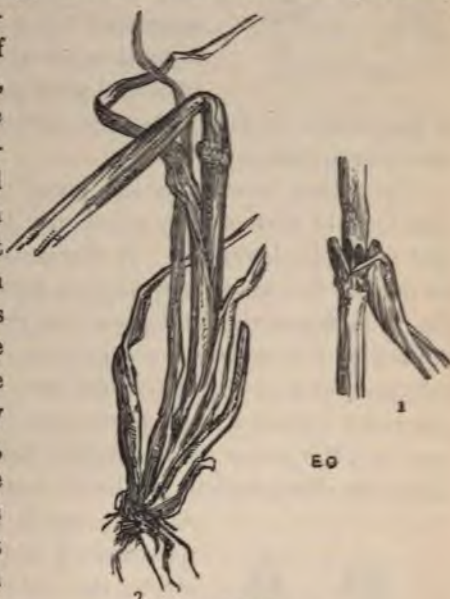
(To be continued.)

THE HESSIAN FLY IN BRITAIN: LIFE-HISTORY.

BY ELEANOR A. ORMEROD,

F.E.S., Consulting Entomologist R. Ag. Soc. Eng.

On the 28th of July I received specimens from Revell's Hall, Hertford, of injured barley, which on examination precisely corresponded with the condition caused by attack of the *Cecidomyia destructor*, commonly known as the Hessian Fly. On investigation on the spot I found the puparia fixed beneath the sheathing-leaf just above the second joint, in the manner described as characteristic. They were laid lengthwise along the stem, and frequently firmly attached at one extremity, which is caused by the larva lying so motionless at the spot at which it is feeding that the stem slightly advances round the point of attachment.



Injured barley.

For the various works of authority which I have consulted on the subject I refer to my recently-published pamphlet,* as they are too numerous to be quoted here.

On the dissection of the puparia I found the larva within still little changed, and was able to identify it as a *Cecidomyioides* larva, and likewise as corresponding with that of *C. destructor* in the very peculiar form of its anchor process, which, though roughly, is clearly shown in Dr. Packard's paper on Hessian Fly (formed in connection with Prof. Riley, Dr. Cyrus Thomas, and other personal observers of the attack, published in the 'Third Report of the United States Entomological Commission, 1880').

* 'The Hessian Fly in Great Britain.' Simpkin, Marshall & Co.: London. Price 6d.

I shall perhaps be excused in mentioning that I have devoted especial attention to the study of Cecidomyioides larvæ and the form of the anchor process for some years; the subject was therefore one with which I was conversant.



Anchor process.

The peculiar alteration in colour of the larva in this early stage of partial pupation was also described by Dr. Wagner, and accounted for by him as the result of the formation of adipose matter. In a more advanced stage the colouring further changed

to that stated to accompany the first development of the parts of the embryo imago.

To return now from the larval contents to the puparium. The form of this corresponded with the very exceptional form of that of the *C. destructor*. It resembled a flax-seed so nearly that on mixing flax-seeds and puparia together it was impossible at a glance to detect the difference. On more minute examination the figures of the puparia were narrower, and, though they had the flattened form of the flax-seeds, they were distinguishable by one extremity having a mark across, as if it had been pinched in at one end, the other being slightly bent forward. These appearances are characteristic of the *C. destructor* puparia at this stage.



E O

Pupa, &c.

At first (as it was an early condition of pupation) I did not find the longitudinal striæ; the outer skin, which had changed to chestnut-brown of lighter or darker tints, according to its age, still preserved the slight transverse markings, showing the divisions of the segments in the larval state. As the colour deepened the striæ appeared, and were clearly visible running

longitudinally from one extremity to the other, in the manner shown in my own figure, from life, accompanying.

As I was unwilling to rest on my own opinion in such an important matter, I forwarded specimens of the infested stems to our Life-President, and trust I shall not be out of order in giving his own words. After just thanking me for details, &c., "of attack of the Hessian Fly," he wrote, "There can be no doubt that such is really the true 'Simon pure'; more's the pity." On sending further specimens, Prof. Westwood wrote with regard to

these "stems and also puparia of the Hessian Fly. The latter agree exactly with Austrian specimens I received from M. Lefebvre many years ago, sent to him by Dr. Hammerschmidt, of Vienna." I further forwarded specimens and full details to Professor W. Saunders, President of the Entomological Society of Ontario, Canada, whose entomological position is too well known to require any observation from myself, and who was eminently qualified from personal scientific and practical knowledge of the attack to offer an opinion, and from him I received the statement:—"The wheat-stem pests, enclosed in your letter, which are embedded in the stalks of the wheat, are without doubt the true Hessian Fly in its pupal condition, known as the flax-seed state." I may add that in his presidential letter to the Entomological Society of Ontario, recently delivered, Professor Saunders officially announced the appearance of the Hessian Fly in Great Britain from my specimens and details, my letter of details being read by Mr. James Fletcher, the Consulting Entomologist of the Department of Agriculture of the Dominion.

In regard to development of the imago and determination of the same:—On the 8th of September an excellent specimen developed. By forming a long wand of twisted paper and just moistening the tip with a little chloroform I secured the imago without injury, and also still so far alive that I was able to watch it through the changes of tint, described by Dr. Wagner, from a golden brown, through the shades of mulberry with transverse black bands above on the first six segments of the abdomen, on to the general brown tints of the abdomen, in which the difference of appearance of the black velvety spots on the sides of these segments almost disappear, and the black transverse bands are not very noticeably different in tint from the browner colour. The an-



tennæ and tarsi, and all the points that it was possible for me to examine, precisely corresponded with those of *C. destructor*, —I do not say with the description given by this or that observer, as in a case of this enormous importance I examined into the

points of all the best descriptions, and where the points were not clear tabulated the descriptions in parallel columns that I might be absolutely certain. The only point in which I found a marking not recorded in the descriptions is, that when I placed the specimen upright, so as to have a view of the upper part of the abdomen, I observed a minute marking, like a V, with two small lines, one on each side of it, which marking was placed in somewhat darker or greyer tint than the yellowish colour of these segments on a portion of the 7th and 8th segments of the abdomen. This slight marking, it is unnecessary to say, is not material to specific differentiation.

Above I have mentioned that I found the imago correspond with that of the *C. destructor* "in all the points in which I was able to make comparison," because I did not feel I could be certain of the presence or non-presence of the lamellæ at the extremity of the ovipositor, which are important points in identification. I therefore forwarded the same specimen to Mr. R. H. Meade, of Manningham, Bradford, who was good enough to examine into the matter, and ascertain clearly that the lamellulæ were not present.

To those who are acquainted with the characteristics of *C. destructor*, it will be of interest to know that in this point, in the pediculated joints of the antennæ, in the terminal joint of the antennæ of the female being half as long again as the penultimate, and in the minute points of the neurulation of the wings, the imago which I developed from the British puparia precisely agreed with the description of *C. destructor*, to be gathered by collation, of the points of structure, as well as colour given, by the entomological writers of U.S.A., Canada, and such of the chief European writers as I have quoted above, or had the opportunity of consulting.

Once again, with regard to confirmation, I may be permitted to say that, after minute investigation, I was favoured by Mr. R. H. Meade with the distinct statement:—"I have no doubt whatever about your insect being the true *Cecidomyia destructor*"; and further on in his letter, after giving me point by point the results of his examination, he adds:—"I have no doubt that the real Hessian Fly has made its appearance here."

Since this letter I have had the opportunity of submitting my whole series of specimens to Mr. John Marten, of Albion,

Illinois, who, whilst Dr. C. Thomas was State Entomologist of Illinois, was one of his assistants. As it is from the work of Dr. C. Thomas that the paper on Hessian Fly, published by the Entomological Commission of the U.S.A., is stated by Dr. Packard to be mainly prepared, and as Mr. J. Marten (Dr. Thomas's assistant) has especially devoted himself to the study of this insect, his opinion is one of much value.

I have now the honour to mention to the Society that in every condition, from that of slightly-changed larva up to imago watched through all its changes of colour, the insect under discussion corresponds with the *Cecidomyia destructor* of Say; that the injury to the corn-stalks also corresponds exactly; and, further, that I have received the confirmation of these points on personal examination of my specimens from the high authorities mentioned above. To this I may add that the work of the later brood is also now (or up to my last communication) on the self-sown, or late-sprouted plant, as described in the States. The figures which accompany I have drawn from life.*

THE GENERIC POSITION OF *GRAPHOLITHA* (?) *CÆCANA*.

By J. W. TUTT.

I THINK it is nearly time that the true position of the little *Tortrix cæcana* was settled in our list in a satisfactory manner. It is, I believe, a general opinion among those who know anything about the insect that it is altogether out of place in the position Mr. South has assigned it, *viz.*, at the end of our present genus *Grapholitha*, a position, as my friend Mr. Coverdale remarked (*Entom.* xviii. 219), "which seems about as bad a place as one could find for it."

When Mr. Coverdale first discovered the species in this country in July, 1884, he described it under its continental name, *Grapholitha cæcana*. I suppose most of our entomologists know that there is a greater difference between the continental and British generic divisions of the Tortricina than between those of any of the other large groups, and that our genus

* Abstract of a paper entitled 'Observations from life of *Cecidomyia destructor*, Say,' read at the Entomological Society of London, 1st December, 1886. For the series of figures which accompany we are indebted to the kindness of Miss Ormerod.

Grapholitha is only a very small subdivision of the continental genus of the same name. The continental genus contains a pretty good mixture of our genera, containing species belonging to no less than fourteen of our generic divisions. These are *Ephippiphora*, *Catoptria*, *Endopisa*, *Coccyx*, *Phlæodes*, *Pædisca*, *Spilonota*, *Pardia*, *Penthina*, *Stigmonota*, *Semasia*, *Trycheris*, and *Opadia*; whilst among the species we find forms as widely divergent, as *grandævana* and *corollana*, as *ophthalmicana* and *undana*. In this continental genus, *cæcana* is almost immediately preceded by our species, *Catoptria hypericana*, *C. albersana*, *Endopisa nigricana*, *E. nebritana*, and *Opadia funebrana*, and followed by *Catoptria ulicetana*.

It is easy to understand how the insect was placed at first in our genus *Grapholitha*. At the time of its discovery it was, as previously mentioned, described by Mr. Coverdale under its continental generic name. Just at that time Mr. South was working out his new list (since published), and attached the species at the end of our genus of the same name. Of course it follows that if our generic nomenclature is to stand, an insect belonging to a comprehensive continental genus, like that under consideration, which is discovered for the first time in this country, should be placed in that genus to which its affinities show it to be the most nearly allied. *Cæcana* has certainly no direct affinities with our present genus *Grapholitha*, and it bears a very great resemblance to some of the species in our genus *Catoptria*, and is, in external structure and appearance, closely allied to *hypericana* and *ulicetana*.

It is to be noticed also that in Stainton's 'Manual,' where the continental genus is broken up, a part of our present genus *Catoptria* is retained under the name of *Grapholitha*, and that the genus *Grapholitha* of later lists is formed from parts of three genera,—*Lithographia*, *Hedya*, and *Steganoptycha*. Had Stainton's genera stood, *cæcana* would, among the insects there included, have had a very natural position assigned it. Those who still retain Stainton's system of classification, would do well to retain the insect in the genus.

It is in the newer arrangements that the present false position of the insect stands out most glaringly. In assigning it a position in our lists there seems to be two chief points to take into consideration: first, the general structure and habits of the

imago; secondly, the economy of the larva and its manner of feeding. And here at once a difficulty presents itself, and shows how artificial and unscientific our present arrangement of the Tortricina is. The most natural position, according to the habits and appearance of the imago, is next to *C. ulicetana* and *C. hypericana*; and this is practically its position in the continental lists. To those who think the general appearance of the imago everything, and its earlier stages of no importance, the matter would be settled; but to those who think with me, that the economy and structure of the larva, its manner of feeding, &c., are of the utmost importance in classification, what is there really in the description of the larva and its habits, as given by Mr. Coverdale, to induce us to place the insect in this position? But whilst we retain the present system of classification, all we can ask is that the insects that may be added to our list shall be placed at any rate in some genus where they present no striking contrasts, either in general appearance or habits, and thus make bad matters worse. Our present genus *Catoptria* contains at any rate insects that have great external resemblances, and, under our present system, I think it would be well to place *cæcana* between *ulicetana* and *hypericana*, directly before the latter species, and in future drop the generic name *Grapholitha* for that of *Catoptria*.

Rayleigh Villa, Westcombe Park, S.E.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

COLIAS EDUSA.—The following records have been received of the capture of this species during the past season.—J. T. C.

In the neighbourhood of Deal I took a male *C. edusa* on the 11th, and a female on the 30th of August, both in fine condition. On the 28th of same month I captured, in the same locality, an almost perfect specimen of the variety *helice*.—R. JAMES; Tray's Hill, Upper Holloway, N.

I took five male *Colias edusa* during the last week of August, near St. Leonards, and I saw as many more, males or females, which I failed to secure. From my experience of *C. edusa* in other years in the above locality, I should say that it has been decidedly scarce this season.—ALBERT BONUS; Exeter.

SPHINX CONVULVULI.—At Crouch End, last autumn, I saw a specimen of *Sphinx convolvuli* just under a gas-lamp close to Highgate Archway, but, not having a net with me, I could not capture it. A friend also received a specimen from Lowestoft, taken last season.—R. JAMES; Upper Holloway, Dec. 6, 1886.

SPHINX CONVULVULI.—This insect, which was unusually plentiful in this neighbourhood last year, has been of very rare occurrence this year. I had a specimen brought me on October 4th, which is the only one I have seen. For several evenings in September I watched flowers which are attractive to this *Sphinx*, but I did not see one. Mr. Adye, of Somerford, met with the same bad luck, after having watched attentively for several weeks. Mr. Edgell seems to have been very fortunate at Lewes.—A. DORRITT; Christchurch.

CHCEROCAMPA CELERIO AT HASTINGS.—I have in my possession a male specimen of the above, taken at the latter end of September, 1886, in a small garden in the suburbs of this town, by Miss Gooch. It was seen the day before its capture in the same place. It is in perfect condition, and apparently had not long left the pupa state. I see Morris, in his work, gives St. Leonards as a locality for it, and another specimen was recorded as being captured there last year.—CHARLES PARTRIDGE, Major; Royal West Kent Regiment, Tonbridge, December 30th, 1886.

BOMBYX QUERCUS, CALLUNÆ, OR ROBORIS?—In looking over the other day some old numbers of the 'Entomologist,' I came upon an article by the late Edward Newman on this subject. It occurs in No. 10, January, 1865 (vol. ii., p. 137), and contains a full life-history of *B. callunæ*, the same of *B. quercus*, followed by a differentiation of the two species, which seems to have been made out with great care. Perhaps the differentiation might be repeated for the benefit of those who do not possess the early numbers of the 'Entomologist,' unless there is good ground for supposing that Newman subsequently altered his opinion. His account of *B. quercus*, in his 'British Moths,' looks rather as if he had. My own knowledge of the subject is perhaps not worth much, but here it is. At Hayward's Heath, Sussex, where I lived till within the last few months, and collected for many years, I both took and bred females of *B. quercus* or *callunæ*, pale and dark. I never noticed any difference between the

larvæ; but the cocoons from which the pale females emerged were light brown, those from which the dark ones emerged were nearly black. I never had any of these larvæ feeding on ling, and never had, as far as I recollect, any stay over in the pupa state till the second year, so I concluded that I had only varieties of *B. quercus*. I formed my collection under the disadvantage of working almost alone, and without opportunity, except on very rare occasions, of seeing any other collection. After reading lately Newman's differentiation of these species, I should be much inclined to think that I have both *B. quercus* and *B. callunæ* in my series were it not that I am quite certain I never had any larvæ feeding on ling. But then some of the specimens I caught flying might have fed on ling.—T. E. CRALLAN; Emsworth.

THE GENUS SCOPARIA.—Since the appearance of my note on this genus (Entom. xviii. 129) much progress has been made in working it out. Mr. Banks has, with Mr. Stainton's assistance, satisfactorily disposed of *phæolucalis* by striking it out of our lists altogether, and relegating our English specimens to the sub-rank of a variety of *mercurella*, under its original name, *portlandica*. Mr. Mason recently has telescoped *conspicualis* into the long lost *ulmella*, thereby sending another of our northern names after so many of its predecessors, while *zelleri* and *gracilalis*, except with a few who still cling convulsively to our printed lists, have respectively sunk quietly into *cembra* and *alpinalis*. Much, however, still remains to be done. Inspection of a large number of *basistrigalis* has shown that there is a form as nearly as possible intermediate between that species and *ambigualis*, but to what this fact will eventually lead us I am at present unable to say. Possibly *basistrigalis*, distinct as it appears, may in time have to sink as a variety of *ambigualis*. Similarly the specimens forming the intermediate links between *ambigualis* and *atomalis*, render the position of the latter very unsatisfactory; while we still want some definite boundary line between *mercurella* and *cratægella*. If, during the ensuing season, entomologists would turn their attention to these species, carefully labelling each specimen with its locality and date, we might, by the end of 1887, have the genus once more in a clear and intelligible state. C. A. BRIGGS; 55, Lincoln's Inn Fields, December 18, 1886.

TRIGONOPHORA FLAMMEA BRED.—This autumn I have succeeded in rearing eight specimens of *Trigonophora flammea*.
ENTOM.—JAN., 1887.

(*empyrea*), two being crippled and the rest fine specimens. The larvæ, which hatched out on the 4th of December last from ova laid about the middle of October, were kept through the winter in a room without a fire, feeding on low plants, chiefly buttercup (*Ranunculus bulbosus* and the allied species), and later on the lesser celandine (*R. ficaria*), but they do not seem to be attached to any particular plant, and I have not noticed the lesser celandine growing in the locality for the imago. They were feeding all through the winter, but grew very slowly. As the larva has been already well described by Mr. Woodbridge in the 'Entomologist' for June, 1885, I need not attempt any further description, as no doubt he had the larva in its last stage. Towards the end of April, the larvæ, having changed their skins for the last time, and become brown instead of bright green, as they had been through the winter, refused the various low plants offered to them. I then supplied them with shoots of privet and the blossom and young buds of ash. They took readily to the latter, and several spun their loose earth cocoons near the surface of the ground about the middle of May. Several larvæ died about the middle of April, probably from being kept in jars without sufficient ventilation during the winter. The moths emerged rather later than the species does as a rule in a wild state, the first emerging on the 8th of October and the last on the 20th. The species was very scarce near here this autumn; in fact, I only took three fine specimens, and two of those were on the 24th of September. All attempts at forcing the larvæ in the winter failed, and the only pupa which did not produce a moth was one I tried to force. Some larvæ of *Agrotis saucia*, placed in a hothouse towards the end of last December, fed up rapidly and produced imagines in February and March.—WILLIAM EDWARD NICHOLSON; Lewes, November 22, 1886.

EUMENES COARCTATA AND ITS PARASITE.—Mr. W. McRae, in November, sent two cells of *Eumenes coarctata*, and four ichneumons which had been bred from them; two of the parasites were males of *Linoceras macrobatus*, a very rare Cryptid. Mr. Pascoe took a male at Ventnor; this, I believe, is the only one that has been taken recently in Britain. Perris and Graf bred it on the Continent from *Eumenes coarctata*, and Giraud from *Osmia adunca* (see Entom. xvi. 36). These are, so far as I know, the only records of *Linoceras* having been bred.

It is very interesting to find that it has been bred in England from the same host. *Eumenes* is a rare insect in this country, and consequently the parasite is probably rarer. The cells of the wasp were taken by Master Fred. Wolamore at Bournemouth early in May last; they were attached to charred twigs of heath, which had been burnt down in February, 1886, so that the cells were formed in the spring. Each cell was kept in a separate glass-topped box, and from each issued a male *Linoceras*,—one on June 14th, and the other on June 20th; but, singular to relate, the former of the two had two companions, for on May 28th a Bracon issued from the same cell. This has been sent to the Rev. T. A. Marshall, who, from the examination of a single specimen only, does not like to be positive, but believes it to be *Rhogas modestus*, Rhein., a species new to Britain, and very like the common *R. conscriptus*; and on June 14th a specimen of *Campoplex subreptus*, Tst., was bred. The fact of these latter being bred from the same cell as a *Linoceras* looks very like being a case of instinct at fault; both the Bracon and the *Campoplex* have an aculeus too short to pierce the cell and sting the *Eumenes* larva. The only other way I imagine the parasites could get into the cell is that the female *Eumenes* must have taken larvæ for her young which had previously had the ichneumon egg deposited in them, and the parasites were the first to suck the juices from the deposited larvæ, and were protected by the dry skins from the *Eumenes* larva. These two small cocoons, Mr. McRae says, laid between *Eumenes* pupa and the wall of the cell. Master Wolamore has very kindly given me one of these very rare ichneumons.—J. B. BRIDGMAN; Norwich.

HENICOSPULUS MERDARIUS BRED.—Mr. B. A. Bower very kindly sent me *Henicospilus merdarius*, which he had bred from *Hecatera serena*, on the 12th October last. As this latter is a new victim for *H. merdarius*, I think it is worth recording. This species, at first sight, looks very much like a testaceous *Ophion*, so often seen on the gas lamps in rural districts, but can be very easily separated from it by the fore wing having two horny spots in the first cubital cell.—G. C. BIGNELL; Stonehouse, Nov. 29.

ERRATA.—Entom. xix., page 302, line 4 from bottom, for "variation" read "variations"; l. 7 from bottom, for "experiment" read "specimen." P. 305, l. 22, for "April" read "May."

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. *December 1st, 1886.*—Robert McLachlan, Esq., F.R.S., President, in the chair. Mr. W. H. Miskin, of Brisbane, Queensland, Mr. R. E. Salwey, of Folkestone, and Mr. F. W. Biddle, M.A., of Beckenham, were elected Fellows. Mr. Howard Vaughan exhibited a long series of *Gnophos obscurata*, comprising specimens from various parts of Ireland, North Wales, Yorkshire, Berwick-on-Tweed, the New Forest, Folkestone, Lewes, and the Surrey Hills. The object of the exhibition was to show the variation of the species in connection with the geological formations of the various localities from which the specimens were obtained. Dr. Sharp showed a series of drawings of New Zealand Coleoptera, by Freiherr von Schlereth, which, though executed in pencil, were remarkable for their delicacy and accuracy. Mr. R. Adkin exhibited specimens of *Cidaria reticulata*, recently bred by Mr. H. Murray, of Carnforth, from larvæ collected by him near Windermere, on *Impatiens noli-me-tangere*. Mr. Adkin said that as the food-plant was so extremely local, and consequently difficult for Mr. Murray to obtain, he had endeavoured to get the larvæ to feed on some other species of balsam, including the large garden species, usually known as Canadian balsam, but that he had not succeeded in doing so. Mr. E. B. Poulton observed that this statement tended to confirm the remarks he made at a recent meeting of the Society on the subject of the habits of lepidopterous larvæ with reference to their food-plants. Mr. Billups exhibited a number of living specimens of *Aleurodes vaporariorum* (Westw.), obtained from a greenhouse at Snaresbrook, where they had caused great havoc amongst tomato plants (*Lycopersicum esculentum*). He remarked that the species had been first figured and described by Prof. Westwood in the 'Gardener's Chronicle,' 1856, and that attention had been recently called to it by Mr. Douglas (Ent. Mo. Mag. for December). Mr. J. Jenner Weir stated that plants in his greenhouse had been attacked by the same species. Mr. Poulton exhibited the bright green blood of the pupa of *Smerinthus tiliæ*, which is one of many lepidopterous pupæ possessing a chlorophyll-like pigment (called meta-chlorophyll by Mr. Poulton) in the blood. The blood of the larva contains the same pigment in a much smaller amount, *while in the pupa* the additional colouring-matter fixed in the

larval hypodermis cells also passes into solution in the blood. By means of a Zeiss micro-spectroscope, Mr. Poulton was able to show the most characteristic absorption-band of the pigment, together with its resemblance to chlorophyll. Mr. G. T. Porritt exhibited forms of *Cidaria suffumata* from Huddersfield, including one very similar to that taken at Dover by Mr. Sydney Webb (Proc. Ent. Soc. 1886, p. xxv); and one still more extreme, having only the basal mark and the central stripe, with a slight streak at the tip, brown, the remainder of the wings being perfectly white. He also exhibited a series of small bilberry-fed *Hypsipetes sordidata* (*elutata*) from Huddersfield, showing green, red-brown, and black forms. Mr. S. Stevens exhibited forms of *Camptogramma bilineata* and *Emmelesia albulata* from the Shetland Isles, and a curious variety of *Chelonia caja* from Norwich. The Secretary read a letter from the Administrator-General of British Guiana, on the subject of the urticating properties possessed by the larvæ and pupæ of certain species of Lepidoptera collected in Demerara. Mr. M'Lachlan read "A note concerning certain Nemopteridæ." Miss E. A. Ormerod communicated a paper "On the occurrence of the Hessian Fly (*Cecidomyia destructor*) in Great Britain." It appeared from this paper that there could be no longer any doubt as to the occurrence of the insect in this country, specimens obtained in Hertfordshire having been submitted to, and identified by Prof. Westwood, and by Mr. W. Saunders, of London, Ontario. Prof. Westwood said the specimens agreed exactly with Austrian specimens in his possession, sent to him some years ago by Mons Lefèbvre, who had received them from the late Dr. Hammerschmidt, of Vienna. A discussion followed the reading of this paper, in which the President, Mr. C. O. Waterhouse, Mr. Theodore Wood, and others, took part. At the close of the Ordinary Meeting a Special Meeting was held, for the purpose of considering certain proposed alterations in the Bye-Laws. The proposed alterations having been explained to the Meeting, were, after some discussion, agreed to, and the proceedings terminated.—H. GOSS, *Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*December 2nd, 1886.* R. Adkin, Esq., F.E.S., President, in the chair.—Mr. W. Farren, of Cambridge, was elected a member of the Society. Mr. Wellman exhibited examples of *Satyrus semele* and *Lycana icarus* from Ireland.

Mr. Tutt, long series of the genus *Agrotis*, and, for the purpose of comparison, some specimens of *A. cursoria* and *A. aquilina* from Mr. Percy Russ, of Sligo. In Mr. Russ's box were specimens of *Epunda lutulenta*, vars. *luneburgensis* and *sedii*. Mr. Tutt contributed some observations on his exhibit. Mr. Adye, varieties of *Hemerophila abruptaria* and *Epinephele ianira*. Mr. R. South, various species of *Rhopalocera* from the Amor Valley, Siberia. Mr. Adkin, *Cidaria reticulata* and varieties of *Sarothripus undulatus*, Hb., from the New Forest. Mr. Tugwell, a number of insects from New Caledonia, among them a specimen of *Chaerocampa celerio* similar to the type found in this country. Dr. P. Rendall, *Vanessa antiopa*, also a specimen of *Noctua festiva*, var. *conflua*; a discussion ensued as to whether *conflua* was a distinct species or not. Mr. Hall, a specimen of *Locusta viridissima* taken at sugar. Mr. Tugwell stated he had frequently seen this species at sugar on the sand-hills, Deal, and in his opinion it came there for the purpose of feeding on the moths that were attracted by the sugar, as he had many times seen it make a meal of as large an insect as *Phlogophora meticulosa*. Several other members contributed remarks on Mr. Hall's exhibit. Mr. Billups exhibited a species of Coccidæ, *Aleurodes vaporariorum*, Westw., taken from a greenhouse at Snarebrook, Essex, December 2nd, on the leaves of tomato, *Lycopersicum esculentum*, where it had been doing an immense amount of damage to the plants. He stated the species was first described by Professor Westwood in the 'Gardeners' Chronicle' for 1856, but for a later description he would refer members to the 'Entomologist's Monthly Magazine' for December, where it was described by Mr. J. W. Douglas, to whom he was indebted for the identification of the species. Mr. South read a short paper on "British Snake-like Reptiles."

December 16th, 1886. The President in the chair.—The following gentlemen were elected members: Mr. F. W. McDonald, Mr. C. A. Briggs, Mr. T. H. Briggs, Mr. W. L. Distant, Mr. H. Hutchinson, Mr. J. A. Clarke, Mr. G. Skinner, and Mr. C. S. Bouttell. Mr. Adye exhibited *Sphinx convolvuli*, taken at Christchurch, 1875, and he remarked that although he had been out about forty nights during the past autumn he had not seen a single specimen. Mr. Adkin exhibited, on behalf of Mrs. Hutchinson, a male specimen of *Stauropus fagi*, with female

antennæ. Mr. Dobson, wasps' nests of the genus *Odynerus*, found under a doorway in the New Forest. Mr. Billups, three species of Ichneumonidæ, new to Britain, viz., *Bassus bizonarius*, taken in his garden at Peckham, May, 1885; *Erromenus* (*Trichocalymma*, Foerst.) *plebegum*, Wolds., taken at Dulwich, June, 1885; *Perilissus triangulatus*, Bridgm., the male from Peckham, and the female from Dulwich, May, 1885. Mr. Billups stated he was indebted to his friend Mr. J. B. Bridgman, for the identification of these species, which he had fully described in a paper read before the Entomological Society of London, July 7th, 1886, and printed in the Society's Transactions for 1886. The Secretary then read the Council's Report, and the Treasurer an abstract of his accounts for 1886. The election of officers for the coming year was next proceeded with, and resulted as follows:—Mr. R. Adkin, President; Mr. R. South, Vice-President, Mr. E. Step, Treasurer; Mr. Chaney, Librarian; Mr. W. West (Greenwich), Curator; Mr. H. W. Barker, Secretary; and Messrs. T. R. Billups, J. T. Carrington, W. A. Pearce, W. H. Tugwell, J. R. Wellman, W. West, and J. Jenner Weir, Council.—H. W. BARKER, *Hon. Sec.*

REVIEW.

Rhopalocera Malayana: a Description of the Butterflies of the Malay Peninsula. By W. L. DISTANT. Royal 4to, pp. 481; 46 Coloured Plates and 129 Woodcuts. London: W. L. Distant, care of West, Newman & Co. Penang: D. Logan, Esq.

THE first part of this magnificent work was reviewed in the 'Entomologist,' 1882, pp. 118, 119. The anticipation then formed, that the result of Mr. Distant's laborious undertaking would prove a masterpiece, has been fully justified. There can be no doubt that the author has produced a really standard work, which will be quite indispensable to the student of the *Rhopalocera* of the Indo-Malayan sub-region, and also of the greatest value to students of the order in the sub-regions contiguous. The character of the chromo-lithographed plates, which in the former review were said to be all that can be desired, has been fully sustained throughout the volume. One of the most instructive parts of the work is the very careful manner in which the geographical distribution of each species

has been given. This must have entailed great labour upon the author, but its value can scarcely be over-estimated.

Mr. Distant appears to have encountered the usual difficulty in defining the limits of a species, but his remarks on this head are very sound, and he has an excellent method of generalising the differences between closely-allied races or species; for instance, at page 28 he points out that between *Euploea diocletianus* of Northern India, *E. rhadamanthus* of Malacca, and *E. lowii* of Borneo, the principal difference is that of a gradually increasing melanism, which is least in the North Indian and greatest in the Bornean form. Such truly philosophic observations, with which the book abounds, render the reading of it a delight.

The author makes very short work of mere variation, and suppresses Mr. Moore's name of *Danaïs* (*Salatura*) *intermedia* for the variety of *D. genuta* with a more or less white ground to the under wings; on the other hand he gives full prominence to the name conferred on a well-marked boreal race; for instance, *Danaïs melanippus* is a Javan species, not found in the Malay Peninsula, where its place is taken by *Danaïs melanippus* var. *hegisippus*, as Mr. Distant terms it. This differs from the type in having a white ground to the under wings, but this difference is constant, and not occasional as in *Danaïs intermedia*, Moore. This last name is not well chosen, although it is desirable to have some name to express the difference between the type and a well-marked variety. Mr. Distant has, therefore, in a similar case, adopted the name of *Danaïs chrysippus* var. *alcippoides* for the variety of that species, with white in the centre of the under wings, and has figured it, Plate XL., No. 13; still this variety is occasional only. The variety of the dark African form of *D. chrysippus*, *alcippus*, is in many parts of that continent the common, if not the only form; at Accra and the Cameroons, for instance. It is singular that in several species, and in widely different parts of the world, there should be a tendency in the red Danaine butterflies to have a variety with white under wings; indeed in the case of *Danaïs* (*Salatura*) *edmondi*, from the Philippines, the white colour extends to the upper wings, which have but a faint trace of rufous. Can this whiteness be due to reversion to the colour of an ancestor the common parent of the species now placed in the genera *Limnas* and *Salatura*?

In conclusion it may be said that the work is a credit to the author, the chromo-lithographer, and the printer.—J. J. W.

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[No. 285.]

ON MELANISM.

By N. F. DOBRÉE.

So much has been written on this subject that it might be considered threadbare; but as it has always been treated from a purely insular point of view it is permissible to take it up once more and examine it from the broader basis of its bearing on European insects generally. British entomologists apparently overlook that from such a standpoint the matter can be presented in a fresh light, which may tend to disprove more than one of the theories which pass current amongst us. I propose to do so briefly.

Adopting as a means of comparison Dr. Staudinger's definition of the range of European Lepidoptera (though perhaps it is questionable how far he is justified in including Central Asia within its limits), let us pass to a careful examination of any of the large collections in continental museums, carefully noting the habitat of the species before us. The first striking feature is the generally larger size which prevails in the imago and also in the larva, so far as opinion of the latter can be formed from preserved specimens. We also note that the imago type is uniformly of distinctly lighter colouring than our own, and that where variations occur they are usually in the direction of a lighter rather than a darker shade. So many examples of this may be given that I only note a few taken from my collection:—*Orthosia suspecta*, to warm light grey in Austria. *Hadena dissimilis* (*suasa*), beautifully variegated, suffused with pink in Central Germany. *H. adusta*,

quite light brown, powdered with grey on the borders of the Baltic. *Dasycampa rubiginea*, lighter shade of colour, and also quite unicolour, Central Germany. *Miana literosa*, pale slate grey and almost unicolour in various parts of Germany.

If we now proceed with our examination, and lay a map of Europe before us, it will be found—taking, say Central and Southern Germany as a starting-point—that melanism gradually becomes perceptible as the eye takes a North-west direction, and directly the Channel is crossed has become decidedly marked, if we place even our most southern English forms in juxtaposition with those at our starting-point. As we continue to travel mentally in a North and North-west direction through the British Isles this increases in intensity, until it finally culminates on the western coast of Ireland, and especially in the extreme north of Scotland and outlying islands.

Returning now to our point of departure, and travelling in imagination due Northwards, the curious feature will appear that no melanism such as ours will be found along the most northern littoral of Germany or Denmark, neither will it be found if we take a north-easterly line through European Russia and Siberia. Stranger still, neither this nor reduced size is apparent when the Arctic Circle is entered; and the most marked feature which presents itself in high latitudes is in the quite opposite direction of a tendency to light colouring and obliteration of markings.

[As illustrations I give some of the most marked variations drawn from my own collection, but they could be largely supplemented. Thus:—*Agrotis segetum*, *Noctua festiva* ? *conflua*, *Tæniocampa gracilis*, *Pachnobia hyperborea*, *Anchocelis rufina*, *Xanthia gilvago* (after passing through a lighter variety, *pyrrhago* bears on the Amur a close resemblance to *flavescens*), *Phlogophora meticulosa*, *Hadena pisi*, *Brephos parthenias* = *infans*, *Euclydia glyphica*, all have the markings more indistinct and a generally fainter colouring, with a glaucous tendency, not observable in any of our most southern English forms.

To be, however, impartial, there are a few occurrences in the opposite direction of darker colouring, such as *Thyatira derasa*, *Leucania impudens* (*pudorina*), *L. turca*, *Noctua plecta*, but all with a glaucous shade. These comparisons might be continued into Canada, where the whole of the Noctuidæ bear close resemblance to European and especially British forms, and indeed many are

identical, but where the melanism which occurs with us is quite unknown.

It cannot fail to be observed that these illustrations are all taken from the Noctuidæ. This great division has always interested me most owing to the great variation in the species, but in a superficial examination of the other divisions I have seen the same rule hold good.]

This at once fixes the fact that melanism is of purely British occurrence, thereby upsetting the assumption of our theorists—who indeed do not say so in as many words, but evidently desire it to be inferred—that darker colouring and reduced size is a feature of high northern latitudes. Notably it destroys Lord Walsingham's latest and ingenious theory that a large expanse of white snow tends to produce it, for if it were true in Great Britain it must of necessity be much more pronounced within the Arctic Circle; this, however, is not supported by actual observation.

Another feature in the examination of a large continental collection, which still has to be explained, is that if we once more return to our starting-point in Central and Southern Germany, and turn our eyes southwards, it will be found that the prominent features of lighter colour and fainter markings of high northern latitudes again become apparent. Thus, *inter alia*, in Sicily and Spain, *Acronycta megacephala*, *Leucania lithargyria*, *Aporophylla australis*, *Agrotis trux*, *Noctua xanthographa*, *Hecatera chrysozona* (*dysodea*), *Hadena peregrina*, *Anchocelis litura*, *A. lunosa*, *Luperina dumerili*, are all more or less lighter, with glaucous shade of colour. In Asia Minor, *Triphæna ianthina* and *Amphipyra tragopogonis* are distinctly larger and more grey. In Russian Turkestan, *Asteroscopus nubeculosus* and *Calocampa exoleta* are quite ashy grey; and *Caradrina cubicularis*, *Charæas graminis*, *Noctua flammatrix*, paler and lighter, with the same tendency to glaucous. In fact nearly all the Noctuidæ which I have seen from the borders of the Mediterranean have this glaucous tendency.

The absence of melanism in continental Europe is not, however, without its exceptions, for in the high alps of Switzerland, Styria, and Carniola it occasionally appears. *Agrotis trux* there becomes identical with our *A. lunigera*, *Hadena dentina* is as dark as specimens from Shetland, *Acronycta euphorbiæ* becomes

var. *montivaga* (= *myricæ*), and several non-British species which are light in Central Germany change similarly to a melanic shade.

Thus far this paper is a mere record of facts, which it is within the reach of any entomologist to verify on his next autumnal tour on the Continent; but the inference can be drawn that we originally owe our insular fauna to migration from the south, and that melanism is primarily due to the peculiar geographical position of these islands. This wave of migration was arrested on reaching our most northern shores with the natural outcome of stunted forms, and melanism became the result of the want of the accustomed succulent food, and of a climate, warmer certainly than that within the Arctic Circle, but still sufficiently cold and with sufficiently short summers to arrest the development capable in the milder climate of the insect's original home. The appearance of melanism in the high mountainous regions of continental Europe, where the same causes obtain, as in our extreme north, help to support this view. Yorkshire melanism may be treated as merely local aberration, not affecting the general question.

In these days of close enquiry it is rather surprising that no lepidopterist has thought of rearing some of our Shetland species from the egg,—say *Noctua festiva*, which is a conspicuous and common example,—and experimenting whether the succulent food and milder climate of Southern England will not, in one or two generations, reproduce our southern form.

Writing this paper leads on to an expression of regret, which must be felt by many, that we have in England no central body to look up to for information and reference. In these days of progress it may be worth the consideration of the Entomological Society of London, since its incorporation by Royal Charter, to place itself in touch with provincial societies, and make itself in reality the head and exponent of British Lepidopterology.

New Walk House, Beverley, E. Yorks, January, 1887.

ON THE "*LITA*" GROUP OF THE GELECHIIDÆ.

By J. W. TUTT, F.E.S.

CAN any of our entomologists give me any information with regard to that part of the *Lita* group of the Gelechiidæ containing

the following species:—*marmorea*, Hw., *junctella*, Dougl., *vicinella*, Dougl., *leucomelanella*, Sta., *maculiferella*, Sta., *knaggsiella*, Sta., and *semidecandriella* (n. s.)? I know *marmorea* well. I have taken *maculiferella* among hawthorn in Westcombe Park (close to my house); and on the sand-hills at Deal I have taken a large number of specimens belonging to this group, forming in their extreme variations four very good types, but connected by almost every possible intermediate form. The following are the principal types:—

No. 1 is a very pale, greyish white form, with a very dark and distinct black line crossing the anterior wings obliquely from the costa, commencing at about one-fourth from the base, and extending not quite across the wing to the inner margin, which, if continued, it would meet at one-third from the base. Near the hind margin is a very pale slightly curved line, and between this and the hind margin the ground colour is rather darker grey than the rest of the wing. It has also a conspicuous black spot on the disk of the wing, and one—in two or three specimens—at the apex.

No. 2 is exactly like No. 1 in ground colour, but is without the black oblique line (which is reduced to a second dot in the centre of the wing). The only recognisable markings are the pale curved line and the two dots on the disk.

No. 3 is of a much darker ground colour than No. 1, and closely resembles *maculiferella*, but seems to have a finer, darker, and clearer oblique streak, and the line parallel to the hind margin seems a little more curved than in that species. It is also much clouded, with dark grey each side of the pale line. This form Mr. Threlfall writes me he has bred, and that it has been named *semidecandriella*.

No. 4, an almost unicolorous, blackish (in one specimen quite black) form, with the oblique streak and dot on disk almost lost in the ground colour, the pale line hardly perceptible, and slightly paler on the inner margin.

Between the very pale and black forms I have *almost* every intermediate grade. I say *almost*, because there are none directly intermediate between 3 and 4; and my own series of some eighty specimens I have divided into seven groups, as follows:—

No. 1.—As described above, = *junctella*, Sta. Man.

„ 1a.—Intermediate between 1 and 2. This form Mr. Coverdale named for me as *knaggsiella*.

No. 2.—As described.

„ 2*a*.—Intermediate between 2 and 3.

No. 3.—As described, = *semidecandriella*.

No. 4.—As described above.

„ 4*a*.—The black specimen mentioned in description of No. 4.

These specimens vary in size. None are larger than *marmorea*, but some are much smaller in each group, except No. 4, the specimens of which are very uniform in size.

No. 1 seems to agree fairly well with *junctella*, Stainton's *Man.* vol. ii. p. 339, although I should hardly say my specimens had a "reddish brown" blotch. Do any of my forms agree with the original description of *knaggsiella*? I cannot find anything about this insect, and cannot help feeling that if Mr. Coverdale is right in his naming of No. 1*a*, that, at any rate, the *Gelechia junctella* of the 'Manual,' *knaggsiella* and *semidecandriella* will all turn out forms of one exceedingly variable species. At present I am rather in the dark; and if any of our older entomologists could give me a correctly-named British or continental type of either *junctella*, *knaggsiella*, *leucomelanella*, or *vicinella* for reference, I should be exceedingly obliged. One thing seems certain,—if No. 1 (*junctella*), No. 1*a* (*knaggsiella*), and No. 3 (*semidecandriella*) are distinct species, then I have at least seven distinct species in my series, for there is quite as much difference in the other groups as in these.

I should not be surprised if No. 4 was a novelty, I have no direct connecting links between Nos. 3 and 4; it is constant in size; but the taking it at same time with the other forms, and its general appearance, have led me to the belief (perhaps erroneous) that they are all one species. That Nos. 1, 1*a*, 2, 2*a*, and 3 are either one species or else five distinct ones, I firmly believe, because only the smallest points of difference can be detected, such as ground colour, partial obliteration of a line, &c.; and if the differences between any two of the forms is sufficient for specific rank, so are the differences between the others. I see in Staudinger and Wocke's Catalogue, "No. 1961, *pulla*, Tgstr. Bidr. 126." Would the description of this agree with my No. 4? which would form a very good connecting link between *maculiferella* and *junctella*, the place assigned it in the list. I see, too, in this list, that between *knaggsiella* and *maculiferella*, &c., are

the species *maculea*, *fraternella*, *viscariella*, *tricolorella*, *costella*, and a continental species *hyoscyamella*. This seems to me another illustration of what Mr. C. A. Briggs says (Entom. xviii. 130), "Crammed in apparently to interpose a scientific frontier between two species so often mixed." "So little known" would do better in this case than "so often mixed."

I see, as localities for *knaggsiella*, Dr. Wocke says—"Germany; ? Anglia." What does the "?" mean? Does it mean that Anglia is a doubtful locality? If so, whence were the original specimens derived from which the species was named? for the same author says, "*knaggsiella*, St. Ann. 1866, 167." Were the original specimens British, as they bear Mr. Stainton's name?

This is a puzzling group, but the different species(?) are nearly all British; and if notes were compared from the different parts of our coast a correct result might, I think, easily be obtained.

Any information that can be given me, either by letter or in the pages of the 'Entomologist' (the latter preferred, as it might help some Micro-lepidopterist), on this group, will be gratefully received. Surely there must be some British entomologists who can give their younger brethren some information on these, to us, knotty points; or are the older entomologists as much in the dark as we are? If so, perhaps the above is a problem worth working out.

Rayleigh Villa, Westcombe Park, Blackheath, January, 1887.

ON THE TORTRICES OF CROYDON AND DISTRICT.

BY W. G. SHELDON.

DURING the past season I devoted some time to working up this group; and as Croydon is one of the most accessible localities from London, a few notes from my diary may not be unacceptable to some of your readers who are commencing to study this interesting division. Omitting many species of universal occurrence, I may mention the following:—

Tortrix forsterana, a specimen being netted in my garden, I instituted a search amongst ivy in the neighbourhood, and found the empty pupa-cases tolerably common, but was too late for tenanted ones.

Peronea logiana (*tristana*), a few larvæ on guelder rose (*Viburnum lantana*) at Purley. *P. aspersana*, one female only, Riddlesdown.

Dictyopteryx holmiana, a series from whitethorn. *D. forskaleana*, swarming in June, amongst maple (*Acer campestre*), on Riddlesdown.

Argyrotoxa conwayana, generally distributed, and common amongst privet (*Ligustrum vulgare*).

Penthina betulatana, common amongst birch. *P. capræana*, several bred from shoots of willow, West Wickham. *P. gentiana*, larvæ common in a chalk-pit at South Croydon, feeding in seed-heads of teasel (*Dipsacus sylvestris*).

Spilonota rosæcolana, larvæ in cultivated roses in the garden.

Aspis udmanniana, the singular bunches formed by the larvæ of this species were common on bramble.

Sericoris cespitana: this, usually a common species on Riddlesdown, was this year scarce in that locality.

Eriopsela fractifasciana, not uncommon on Riddlesdown, end of April; the August brood not so plentiful.

Cnephasia politana, very common on Shirley Heath in April and May, flying in the afternoon sunshine. Several specimens were also observed in August; these were presumably a second brood, as they were considerably smaller than those taken in the spring.

Sciaphila hybridana, common in all lanes in June, flying in the afternoon.

Phæopteryx comptana, common on Riddlesdown in April, and again in August. *P. derasana*, not rare in hedges near Riddlesdown. *P. mitterpacheriana*, common in oak woods, generally.

Grapholitha ramella, *Phlæodes tetraquetra*, and *Pædisca bilunana*, all common amongst birch at West Wickham. *P. ratzeburghiana*, three specimens were taken from spruce fir in a wood at Addington. *P. solandriana*, common generally.

Ephippiphora pflugiana, larvæ common generally in stems of thistles. These larvæ were of two forms,—one with bright red dorsal area, the other slightly smaller and yellowish white in colour. I concluded these last were the nearly-allied *E. cirsiaria*, but soon found them to be the same species as the others; the fact of their being ichneumonid specimens accounted for difference in size and colour. *E. fenella*, larvæ very common in roots of mugwort (*Artemisia vulgaris*); the imagines bred varied much in colour. *E. nigricostana*, larvæ common locally in stems of hedge woundwort (*Stachys sylvatica*).

Semasia rufillana, larvæ very common about Caterham Junction in seed-heads of wild carrot (*Daucus carota*). *S. spiniana*, not common in August, flying in afternoon sunshine.

Coccyx splendulana, a solitary specimen bred from a large number of oak-galls collected during the winter; this was the only lepidopteron that

emerged from them. *C. argyrana*, common on oak trunks in April. *C. tædella* (*hyrciniana*), swarming amongst spruce throughout the district in June. *C. nanana*, common amongst spruce at West Wickham in July.

Heusimene fimbriana, not uncommon in oak woods in March and April.

Retinia buoliana, larvæ common in young shoots of Scotch fir in May. *R. turionana*, pupæ not uncommon in shoots of Scotch fir at West Wickham, April 21st. A shoot containing a pupa does not start growing in the spring, and can thus be easily distinguished from a healthy one.

Carpocapsa splendidana, larvæ very common in acorns last autumn at Crohamhurst.

Stigmonota roseticolana, generally distributed; larvæ not uncommon in fruit of wild rose.

Dicrorampha politana, local amongst yarrow (*Achillea millefolium*); larvæ feeding in roots. *D. petiverella*, common everywhere amongst food-plant; of same habits as last. *D. simpliciana*, not uncommon wherever its food-plant (*Artemisia vulgaris*) occurs; a series was bred from the roots.

Pyrodes rheediella, a few specimens taken flying over flowers of whitethorn.

Catoptria hypericana, common everywhere amongst St. John's wort (*Hypericum*). *C. cæcimaculana*, local on chalk amongst *Centaurea nigra*.

Trycheris aurana (*mediana*), Riddlesdown in June, flying in sunshine.

Eupæcilia nana, not common in the neighbourhood of birches. *E. dubitana*, local amongst ragwort; larvæ in heads. *E. hybridella* (*hybridellana*), Riddlesdown; one specimen. *E. angustana*, swarming early in August on Shirley Hills. *E. roseana*, larvæ common in seed-heads of teasel.

Xanthosetia zægana, somewhat local, but common where it occurred.

Chrosis alcella (*tesserana*), Riddlesdown, common. *C. rutilana*; although I diligently worked for this species on several occasions amongst its haunts at Riddlesdown, I was only successful in securing one specimen.

Argyrolepis badiana: what I presume to be the larva of this species was very common in the seed-heads of burdock (*Arctium lappa*) during September. In common with many another entomologist, I have searched long and diligently in the roots and stem for this larva (following the advice of the standard works on the subject), with of course no success.

Conchylis dilucidana; the larvæ of this species were exceedingly common in the stems of wild parsnip (*Pastinaca sativa*) in winter and spring.

Aphelia osseana, not uncommon in August on the chalk downs of the district.

Rose Cottage, Oval Road, Addiscombe, Surrey, Dec. 30, 1886.

ENTOM.—FEB., 1887.

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NOTES ON *CECIDOMYIDÆ* DURING 1886.

BY PETER INCHBALD, F.L.S., F.E.S.

THE following notes are upon my year's work among the Gall-gnats during 1886:—

My first Cecid of the year appeared on the morning of April 6th, and was *Cecidomyia betulæ*, from the seed-catkins of the birch. They appeared throughout the month of April, fully 100 emerging in my glass-topped box on the 18th of the month. There was a large preponderance of females beyond what I have noticed in other species that I have yet bred. Franz Loew was the first, I believe, to trace the home of the larva to the seed-capsules of the birch, which it modifies to its special needs and requirements. Sometimes two pupæ lie side by side in the capsule.

Cecidomyia cardaminis, Winnertz, was the next to put in an appearance on April 19th. I bred it from *Cardamine amara* far more abundantly than from *C. pratensis*. I have never bred it from *C. hirsuta*. Its larval home is readily noticed, the flower-heads being made to assume monstrous proportions. I would observe that the colouring of the heads of *C. amara* are even deeper purple than those of *C. pratensis*. All the parts of the flower are utilised by the larva in its economy.

Throughout the month of May the "Knot-grass Cecids," *C. persicariæ*, Linn., hatched abundantly from their snow-white cocoons. I bred it from *Polygonum amphibium*, though on the Continent it also affects *P. persicaria*. Though the two grow together,—often side by side,—I have never seen the larvæ on *P. persicaria*. I bred the gall-gnats very abundantly, both male and female. Sometimes the bell-glass was covered with them. Winnertz tells us that he reared only the females; with me the numbers were nearly equal. The antennæ of the males are stalked, consisting of fourteen joints; in the females the joints are beaded, but not stalked.

Cecidomyia muricata, n. sp. (mihi), began to issue from the seed-spikes of *Carex muricata* on May 16th, at first sparingly, but during the month fairly abundantly. I gathered the affected heads in July of last year. The larvæ fed within the utricle on the embryo nucule, pupating in the spikelet. I bred both the

males and females in nearly equal numbers. (For a detailed account see Entom. xix. 152.)

Cecidomyia urticæ, Perris (Nettle Gall-gnat), put in an appearance this year for the first time on May 26th. The galled heads were gathered Sept. 18th of the previous year. The larvæ are common, affecting the leaf-stalk and ribs of the leaves of the nettle. When full-fed they fall to the ground, and pupate in the soil, spinning a snow-white silken little web. Their colour is greenish white, not red as *Cecid* larvæ usually are. I bred both sexes in fair abundance.

Cecidomyia salicis, Schrk., issued from multilocular bosses on the upper twigs of *Salix cinerea* on June 6th. It is many years since I previously bred it,—in 1861,—according to Mr. E. A. Fitch's admirable 'Synopsis' (which I would ask him to supplement, on the very same principle). The woody excrescence yielded me upwards of a score gall-gnats of both sexes.

Cecidomyia cratægi, Winnertz. — The leafy bosses at the tips of the shoots of the hawthorn of our trim-kept hedgerows yielded me from June 13th quite a bevy of this gall-gnat; and no wonder, as I have counted upwards of a dozen larvæ in some of the larger bosses.

I received on June 13th, from Sussex, the larvæ of *Cecidomyia nigra*, Winnertz, that affects the core of young pears, consuming the pulp. I found them, on cutting open the baby pear, ensconced in the centre, whence blackened tunnels emanated. Mr. Bloomfield, of Guestling, who sent me the young pears, remarked that they had selected the "Marie Louise" pear as their nurse. By July 6th all had left the pears, and pupated in the soil of the flower-pot below the bell-glass. The larvæ is yellowish white. The pupa spins for itself a papery cocoon, which is exteriorly enclosed in an earthen case. Some of its life-history is thus read, and we must hope to read the remainder when the pear-tree puts forth its bloom in the spring. Mr. Bloomfield further says:—"The fly (*Cecidomyia nigra*) has not been reared of late years, and is so incompletely described that it is not known to which division of the group it belongs." We may, I trust, hope to unravel a something further of its life-history.

On July 10th I gathered the gall-like processes of *Cecidomyia galii*, H. Loew, from the stems of *Galium verum* (yellow bedstraw). I may remark that I have often tried to rear this species in other

years, but unsuccessfully hitherto. The metamorphosis is performed under the ground. The gall splits to give exit to the grub, which worms its way into the soil. The larva is yellowish red; the imago is described, by those who have been fortunate enough to rear it, as dingy yellow. On the Continent, according to Kaltenbach, the gnat affects *G. mollugo* and *G. uliginosum*, as well as *G. verum*.

Cecidomyia clausilia, Bouché, began to emerge from the marginal pads on the leaves of *Salix alba* on Aug. 5th, and continued to emerge till fully the middle of the month. This species, though its home is figured by Bremi, was never reared by him; indeed, the *rolled leaves* were regarded as the work of a *Phytoptus* by later writers. Bremi figured the nidus of the gnat in 1847; it appeared in the 'Transactions of the Swiss Natural History Society.' The home of a near ally of *clausilia*, viz., *C. marginemtorquens*, is figured by Bremi on the same plate. This he reared in the summer, he says, in fair abundance. Like *clausilia*, it also pupated within the curl, though in the former the rolled-in edge was *continuous*, in the latter *interrupted*. I must have reared (Aug. 5th) fifty examples of *clausilia* from the affected leaves I gathered.

On August 28th I noticed the swollen buds of *Rumex acetosella*, the home of *C. rumicis*, H. Loew. On being brought into the house the larvæ escaped from the buds; further observation with a lens revealed tiny white cocoons in each flower-bud. Dr. Trail, of Aberdeen, says the "Cecids are very easily reared from them."

Fulwith Grange, near Harrogate, December 22, 1886.

ON BREEDING VARIETIES OF *ANGERONA PRUNARIA*.

BY GEO. J. GRAPES.

SINCE writing the last notes on this subject (Entom. xix. 302) I have ascertained that the larvæ given by me to a friend in March, 1885, produced some pretty banded forms, including instances in which the wings of the male were crossed with yellow, instead of the usual orange bands. This seems unaccountable, considering that the parents were typical male and

female and not varieties, and affords further evidence, if such were needed, of the variable nature of *prunaria*; also what anomalous forms are likely to result from long and continuous experiments with this moth. The larvæ I received from the same friend in the autumn of 1885 were from the progeny of an ordinary male and an ordinary variety of the female, which progeny he informed me comprised as many varieties as types, a notable peculiarity with the banded forms being that in the majority of cases the bands were much interrupted, extremely so in some instances. The perfect insects resulting from the larvæ given me were three ordinary males, eight ordinary females, five speckled variety males, and three banded variety males,—total, nineteen; the greatest proportion proving typical forms. Viewing the result, however, as regards the effect of sex on offspring, it will be seen that three only were types of the male and none of the female parent, the effect generally being that the male varieties resembled the female, and the typical females the male parent; but this cannot be considered a fair criterion, as the remnant of the larvæ, about thirty, died during hybernation.

I would observe that during the whole course of these experiments the males were more numerous than the females. The numerical superiority of the male is doubtless of frequent occurrence, and probably the rule with lepidopterous insects.

In continuing these experimental crossings, I propose to note carefully which sex in the parent the progeny most resemble, as well as which sex most preponderates, as it is only by repeated experiments and exactness of detail that reliable data can be gained on which to base an opinion of any scientific value on the subject of hereditary descent in insects.

The foregoing remarks comprise all that is worth recording concerning my experiments with *A. prunaria* to the present time, unless the following description of the principal characteristics of the female aberrant forms, referred to in my first notice (Entom. xviii. 253), may be deemed of interest, *viz.*,—First example:—Colour of wings rich dark brown, with bright yellow transverse central bands; ordinary yellow spot at tip of fore wings, replaced by a minute indistinct yellow dot; no yellow markings near apex or tip of hind wings, and but few on cilia of wings, lunated, scalloped, or otherwise; central transverse discoidal streaks sharply and clearly defined. Second example:—Same as first,

except that wings are of lighter brown, and yellow spot at tip of fore wings merges into an irregularly defined band parallel to hind margin, and tapering to its junction with inner margin at hinder angle. Third example:—Same as second, except that transverse bands are very much broader, and yellow spots near tip of fore wings do not merge into fascia. The remaining aberrations are not sufficiently conspicuous to merit description.

2, Buckleigh Road, Streatham Common, S.W., Jan. 21, 1887.

THE GENERIC POSITION OF *GRAPHOLITHA* (?) *CÆCANA*.

By W. WARREN, F.E.S.

I VENTURE to offer a few remarks on the question pertinently asked by Mr. Tutt (Entom. 13). It seems to me that if good specimens of *cæcana* be placed side by side with examples of *Stigmonota dorsana* and *S. orobana*, and the markings carefully compared, there need not remain much doubt about the proper position of the former. The particular prominence and direction of the lustrous line produced from the third gemination, that which immediately follows the central fascia, is noticeable in each of them. This line runs first obliquely from the costa towards the centre, and then suddenly perpendicularly to the inner margin before the anal angle, where it is somewhat dilated. The regular alternation of light geminations and darker intervals all along the costa is observable likewise in all three species. But more than this: in three of the specimens of *cæcana* now before me,—faintly seen in two, but quite visible in the third,—there appears above the inner margin, exactly in the position in which it occurs in *S. dorsana* and *S. orobana*, the curved end of a lunular mark, in this case not lighter than the ground colour, but visibly margined with darker; and the margins are more or less distinctly produced to the inner margin, forming the lower arm of the (usual) pale fascia, which separates the basal patch from the central fascia.

So much for the markings of the imago. I agree, however, with Mr. Tutt, that the larval habits are of equal, I would even say of greater, importance than any number of points of resemblance in the markings of the imago, when it is wished to

determine the most *natural* position of an insect. Of the two insects between which Mr. Tutt now proposes, provisionally only, to place it, *Catoptria hypericana* is certainly a spring feeder, while *C. ulicetana* has at least two, if not three, broods a year, and hibernates as pupa. *S. dorsana* and *S. orobana* feed up in the seeds of vetches, the contents of a single pod furnishing them with a sufficiency. As full-fed larvæ they emerge from the pod, and spin a papery cocoon among rubbish on the ground, in which they pass the winter, and pupate shortly before their time of emergence. The habits of the feeding larva of *cæcana* must of necessity be somewhat modified. The pod of *Onobrychis sativa* is very different from that of a vetch.

Probably, in its earlier stages, the larva of *cæcana* feeds on the seed, and this not sufficing for it, afterwards betakes itself to the stems of the food-plant, in which, apparently, it goes on feeding through the winter, a habit in which, as far as I know, no one of its nearest allies indulges. At all events, as being an autumnal and internal feeder, I should be disposed to assign it a position nearer to the insects mentioned than to *C. hypericana* and *C. ulicetana*. Of genera I say not a word, the natural subdivision of the unwieldy genus *Grapholitha*, Ld., being yet *in nubibus*.

Merton Cottage, Cambridge, January, 1887.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

ANOSIA PLEXIPPUS IN THE ISLE OF WIGHT.—I have a butterfly, taken at Shanklin, I.W., which I believe is unknown to British collectors. Not mentioned in Newman's, or Colman's, or Morris's, or Wood's works on Entomology. The insect measures at least four inches and a half across, is of a bright Vandyke brown with black markings, similar to black-veined white (*Aporia crataegi*), and has a white and spotted black edge to each wing, with deep black line on inner margin; body is black, with white spots on thorax. Is in splendid condition, seemingly fresh from chrysalis.—J. A. BILLINGS ('Hampshire Independent,' December 18, 1886). [It was in 1876 that the Rev. Thomas E. Crallan gave me a drawing, which his daughter had made, of the first recorded specimen of *Anosia plexippus* taken in England, *vide* 'Entomologist,' 1876, pp. 265-7. Mr. Crallan then referred to

the rumours of the appearance of an unusual butterfly in that neighbourhood for some two or three years. I ventured to suggest that the insect might establish itself in this country; and now that it has been taken in the Isle of Wight, in each of the southern counties, and one western, such appears to be the case.—J. JENNER WEIR; January 7, 1887.]

COLIAS EDUSA IN ESSEX.—It may perhaps be as well to record the occurrence of *Colias edusa* in the neighbourhood of Rainham, Essex, on August 20th last, when I observed at least four specimens on the wing in this locality. Not being provided with a butterfly-net, I restrained my natural impulse to capture this old favourite, and contented myself with viewing their beauty whilst flitting hither and thither close by me. The sun during the afternoon was shining intensely, and butterflies, particularly of the commoner species, seemed fairly numerous; indeed more so than I had noticed at any other time during the season.—G. A. LEWCOCK; 40, Oxford Road, Islington, N.

LYCÆNA ICARUS, HERMAPHRODITE (?).—I took on the Landslip, Ventnor, Isle of Wight, 12th August, 1886, a peculiar hermaphrodite of *Lycæna icarus*. The wings of ordinary pale blue of male, on the right side of which the deep brown and orange spots of female is partly developed, and also on the left side, but not to so great a degree.—MALCOLME CAMERON; 102, Clarence Road, Clapton, E., January 12, 1887.

HYBRID LYCÆNIDÆ: CORRECTION.—In the report of the South London Entomological and Natural History Society, October 7th, 1886 (Entom. xix. 286), it is stated that the insects I took in copulation were *Lycæna bellargus* and *L. icarus*. This was not what I wished to convey when exhibiting them. The species I mentioned were *L. bellargus* and *L. corydon*, and my opinion was, and is, that the varieties exhibited by me are hybrids between these species, or else between *L. bellargus* and *L. icarus*. Mr. Weir inclined to the latter view, he having seen a specimen of *Lycæna bellargus* and *L. icarus* together at another locality last season.—E. SABINE; 22, The Villas, Erith, Jan. 12.

PIERIS RAPÆ IN JANUARY.—I found a perfect specimen of *Pieris rapæ* just emerged from chrysalis. Is it not very early? —R. B. ROBERTSON; New Lodge, Hartley, January 17, 1887.

PÆCilocampa populi AT CHESTER.—This insect was common last November at Chester. It should be sought for in the evening, both at rest and on the wing, at gas-lamps, where trees and woods are near. As the moth seems to rest exclusively on the ribs of the lamps it is necessary to use a ladder and lantern.—J. ARKLE; 2, George Street, Chester.

THE HABITS OF *TRIPHENA INTERJECTA*.—My friend, the Rev. Cyril D. Ash, has sent me the following interesting note on the habits of *Triphæna interjecta*. He writes:—"I was surprised the other day in July to see this insect flying in the hottest sunshine about 4 p.m., in a lane near here (Newport Pagnell, Buckinghamshire). I had no net with me at the time. At first I could not make out what the insects were, as I could see enough of the yellow colour of the hind wings to know that they were not *Plusia gamma*; but at last one settled for a moment, and I saw what it was. The next day I went again to the same place, thinking that possibly the occurrence might have been accidental. Nothing was visible at first; but at 4 p.m. out they came again, and I captured one. The others flew so wildly, and the banks were so infested with bramble, that this was all I got. In about half an hour most of them had disappeared."—JOSEPH ANDERSON, jun.; Chichester.

[This habit of *T. interjecta* is known to many entomologists.—ED.]

VENILIA MACULARIA, VARIETY.—Last summer I took a long series of this insect on the outskirts of a wood in this parish. All the specimens I captured were evidently very fresh and in good condition. Amongst them I found some half-dozen to vary from the normal type. The variation in each insect was the same, viz., the upper wings of a *light* orange, the hind wings of the usual shade of the same colour. Is this a distinct variety? It would seem to be, from the constancy of the variation.—J. SEYMOUR ST. JOHN; Chalfont St. Peter, Slough, January, 1887.

EARLY APPEARANCE OF *PHIGALIA PEDARIA* (*PILOSARIA*).—My cousin, Mr. F. Ballard, took a specimen of *P. pedaria* (*pilosaria*) from a shop window on November 30th, and I hear of another collector taking a specimen during the second week in December; such occurrences appear to me exceptionally early.—A. J. WINDYBANK; Ashdown Road, Kingston.

CHRYSOCLYSTA BIMACULELLA AND GELECHIA OSSEELLA IN NORTH KENT.—I have to record the occurrence of two rare species of Tineina, which I captured in North Kent in July last (1886), viz., *Chrysoclysta bimaculella* and *Gelechia osseella*, both beaten out of sallow. This makes the second specimen of the latter insect I have captured, the first being in 1885, as recorded (Entom. xix. 256). Has *C. bimaculella* ever been bred? Mr. Hodgkinson (Entom. xix. 246) seems to suggest that *Epilobium* (willow-herb) is the probable food-plant, although all the recorded examples of the insect seem to have been captured among sallow.—J. TUTT; Rayleigh Villa, Westcombe Park, Blackheath, S.E., Jan., 1887.

LEPIDOPTERA AT SHEFFIELD DURING 1886.—I am ignorant what the past season has been like in other districts, but here it has been most unsatisfactory. The late Mr. Henry Willits told me that, although he had collected in this neighbourhood for upwards of half a century, he never experienced anything like the total absence of really good insects as during the present season. The smoke which pollutes Sheffield must have a great effect on the insect fauna and flora, as Lepidoptera which used formerly to be plentiful have utterly disappeared before the rapid increase which our factories are making on every side of this town.—A. E. HALL; Norbury, Pitsmoor, Sheffield, Nov., 1886.

LEPIDOPTERA IN SOMERSET.—On the whole I have no reason to complain of the season of 1886. *Psilura monacha* came in my way for the first time in my experience on September 7th. My son caught *Pterostoma palpina* in a warehouse at Yeovil on June 19th. *Dasyptilia templi* came to my gas-lamp on October 30th. *Platyptilia gonodactyla* occurred on September 1st; *Crambus selasellus* on August 26th; *Trycheris aurana* on June 26th; *Diurnea fagella* (abundant) on April 23rd; *Hyponomeuta padellus* on August 17th; *Butalis fusco-ænea* on May 30th. All the above are new to my list. Most would probably have been found years before if I had sought in the proper places at the right time; and I should add that I am quite a beginner at the Micros. Many common species were very scarce during the past season, some failing to put in an appearance at all. A few others I found particularly abundant, the most remarkable perhaps being *Alucita hexadactyla*, which seemed to be constantly turning up from April to November.—W. MACMILLAN; Castle Cary.

LARVA IN ORANGE.—I have a larva feeding in an orange, quite in the heart. I hope to breed it. It is pinkish white, with brown head, and black steel-looking collar on the 2nd segment, and black legs. It is a very fast feeder, as it ate into the heart of a fresh orange in twenty-four hours, beginning at the top of the pith, and making quite a cavity in the centre among the pips. After opening the second orange to find if it was inside, I had to give it a fresh one, which it soon entered; but it took the precaution to web over the orifice of its retreat in the last orange, and there it still remains.—C. J. BODEN; 228, Bermondsey Street, London, S.E., January, 1887.

PRESERVATION OF LEPIDOPTERA.—Will any of your readers kindly give me their opinion of corrosive sublimate as a preservative, and also the best way to make it, ingredients, exact quantities, and where to get them? I also should like to know if methylated spirit answers the purpose of the alcohol referred to by Waterton, in his 'Wanderings in South America,' and if it is necessary to entirely immerse the insects in the solution, or merely paint their bodies with a camel-hair brush.—WALTER DANNATT; Ivy Dene, Westcombe Park, Blackheath, S.E.

[For preserving Lepidoptera from the depredations of mites, &c., naphthaline has frequently been recommended, *vide* Entom. 1882 and 1885.—R. S.].

MALPOSITION OF IMAGO IN PUPA-CASE.—A few days ago, while opening some pupæ which had failed to emerge, I came across one of *Lophopteryx camelina*, in which the head of the imago was towards the tail of the pupa-case, and the moth had laid some eggs within the pupa-case; the dorsal surface of the imago was towards the ventral surface of the pupa-case; and I find that this was also the case in one of the pupæ of *Asphalia flavicornis*, previously recorded. In the other the imago was placed laterally, as regards the pupa-case.—W. R. BUCKELL; Romsey, Hants.

CAPTURES AT CHISWICK.—During the past year several new forms have been added to the local list for Bedford Park, and some of them are interesting. These species of Neuroptera have been identified by Mr. McLachlan: *Leptocerus dissimilis*, Steph., found on a leaf of *Phaseolus multiflorus*, and two mayflies, *Cloëon dipterum*, L., and an immature form, perhaps *C. simile*,

Eaton. In the Hymenoptera we have added *Chelostoma campanularum*, Kirb., one found on a flower of *Epilobium hirsutum*; *Homalus aurata*, L., a species superficially resembling *Chrysis ignita*, but much rarer in the district; *Fœnus jaculator*, L., one specimen only, on a thistle, and several other species. *Vanessa io*, *Gortyna ochracea*, *Hadena trifolii*, *Amphipyra tragopogonis*, *Eupithecia rectangulata*, var. *nigrosericeata*, and others have been added to the list of Lepidoptera. The list of Diptera now includes *Tipula lunata*, *T. oleracea*, *Scatophaga stercoraria*, *S. merdaria*, *Calliphora vomitoria*, *Lucilia cæsar*, *Musca domestica*, *Pollenia rudis*, *Dexia lateralis*, Panz., a species allied to *maura*, Fab., but not identical; the British Museum collection does not contain this species, and I have failed to identify it up to the present; one specimen was taken on a gate. *Eristalis tenax*, *Anthomyia pluvialis*, *Triennia errans*, *Chrysomyia formosa*, *C. polita*, *Beris vallata*, *Syrphus corollæ*, *Sarcophaga albiceps*, *Heteromyza nervosa*, *Sapromyza palloptera*, and *Empis livida*. *Hylotrupes bajulus* is the most interesting addition to the Coleoptera.—T. D. A. COCKERELL; 5, Priory Road, Bedford Park, Chiswick, Dec. 8.

SIREX JUVENCUS.—A specimen of *Sirex juvencus* was taken in an ironmonger's store-room here about the middle of September. It was somewhat worn and shabby-looking. It is rather remarkable that almost every year several *Sirex gigas* are found in another ironmonger's shop in this city.—JOSEPH ANDERSON, jun.; Alre Villa, Chichester.

CALANDRA PALMARUM IN SOUTH WALES.—On the 18th July, 1886, my friend caught a single specimen of *C. palmarum* in Pembroke Dock, Wales. It is supposed that it must have been imported in some American cargo.—A. J. FIELD; 145, Isledon Road, Seven Sisters' Road, Finsbury Park, N., January, 1887.

THE STAG-BEETLE (LUCANUS CERVUS) IN THE MIDLANDS.—This handsome beetle used to occur years ago in one locality in the Midlands between Wyre Forest and Stourport, in Worcestershire. Dr. J. W. Williams informs me that he used to take it in abundance in this spot. Can anyone inform me whether it is taken there still? and whether it occurs in any other locality in the Midlands? because it is my impression that this is the most northern locality for the beetle in the country. The Valley of the *Severn* possesses a high average temperature, which may probably

assist us to account for the occurrence of this Austral species so far north.—W. HARCOURT BATH; Birmingham.

ERRATA.—Page 14, line 9 from top, for "*undana*" read "*mediana*." Page 16, line 13 from top, for "A. Dorritt" read "A. Druitt." Page 19, lines 4 and 27 from top, for "Wolamore" read "Dolamore"; line 16 from top, for "*subreptus*, Tst.," read "*obreptans*, Fst."

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. *Fifty-fourth Anniversary Meeting, January 19th, 1887.*—Robert M'Lachlan, Esq., F.R.S., President in the Chair.

An Abstract of the Treasurer's Accounts, showing a large Balance in the Society's favour, was read by Mr. Stainton, one of the Auditors; and the Secretary read the Report of the Council.

The following gentlemen were elected as Officers and Council for 1887:—*President*, Dr. David Sharp, F.Z.S.; *Treasurer*, Mr. Edward Saunders, F.L.S.; *Secretaries*, Mr. Herbert Goss, F.L.S., and the Rev. W. W. Fowler, M.A., F.L.S.; *Librarian*, Mr. Ferdinand Grut, F.L.S.; and as other Members of Council, Messrs. Robert M'Lachlan, F.R.S.; Gervase Mathew, R.N., F.L.S.; George T. Porritt, F.L.S.; Edward B. Poulton, M.A., F.G.S.; Osbert Salvin, M.A., F.R.S.; Henry T. Stainton, F.R.S.; Samuel Stevens, F.L.S.; and J. Jenner Weir, F.L.S., F.Z.S.

The retiring President delivered an address, for which a vote of thanks to him was moved by Mr. E. B. Poulton, seconded by Prof. Meldola, and carried unanimously.

A vote of thanks to the Treasurer, Secretaries, and Librarian was moved by Mr. M'Lachlan, seconded by Mr. Stainton, and carried, and Mr. Goss and Mr. Grut replied. A vote of thanks to the Council was proposed by Mr. Waterhouse, seconded by Mr. White, and carried.—H. Goss, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*January 13th, 1887.* R. Adkin, Esq., F.E.S., President, in the chair.—Mr. R. Frere was elected a member. Mr. Adye exhibited *Dasycampa rubiginea* and *Acherontia atropos*, both taken at Christchurch, 1885, *Cossus ligniperda* and *Boarmia roboraria* from the New Forest, and *Saturnia pavonia* from

Bournemouth. Mr. J. A. Clark, varieties of *Hybernia defoliaria*, taken during the first week in December; also a male specimen of *H. aurantiaria*, in cop. with a female of *H. defoliaria*, from which he stated he had obtained ova. Mr. E. Joy, a variety of *Lycæna corydon*, similar to the first figure in plate I. of the present volume of the 'Entomologist.' Mr. Goldthwaite, *H. aurantiaria* and *H. defoliaria*. Dr. Rendall, *Ino globularia*, *I. statice* and *I. geryon* from Lewes; *Agrotis cursoria* and *Eucosmia undulata*, and called attention to the tufts in the inner margin of the hind wings of the last-named species. Mr. Billups, a species of Coleoptera, *Brachycerus imperialis*, L., and contributed notes. The President read his Annual Address.—H. W. BARKER, Hon. Sec.

REVIEWS.

List of the Macro-Lepidoptera of East Sussex. Lewes, 1886.

By and of J. H. A. JENNER, F.E.S.

THE compiler is to be congratulated upon the locality of his researches, for no portion of the British Isles offers a more excellent opportunity for the study of the Lepidoptera of our country. The varied configuration of the county under consideration may be gathered from a sentence in the introduction, with which Mr. Jenner prefaces his list, viz., "Its downs, marshes, extensive woods and forests, and its sea coast." It is much to be regretted that Mr. Jenner has not seen his way to extend his record to the Micro-Lepidoptera of South-east Sussex in the one publication. We must, however, hope that a list of the Micros will shortly follow.

Mr. Jenner has very properly divided his district by its catchment basins, five in number. They are named as follows:—Adur (part of), Ouse, Cuckmere, East Rother, and Medway. The following is a list of species in different groups taken therein:—Rhopalocera, 55; Sphinges, 30; Bombyces, 91; Noctuæ, 234; Geometræ, 217—Total, 627, as against a possible 818 as given in the 'Entomologist' list of Macro-Lepidoptera. He adds also seven casual or accidental species which have been recorded from his division.

In his preface, Mr. Jenner apologises for the limited extent to which the district has been worked by entomologists. Consi-

dering its accessibility from London and the beauty of its scenery, it does seem extraordinary that more workers have not appeared upon the scene. This can only be accounted for by the custom obtaining among the bulk of collectors of working in one groove, visiting the same localities season after season, instead of striking out for themselves new hunting-grounds, unless "personally conducted." This list will, we hope, draw attention to the eastern half of Sussex, and induce further exploration.—
J. T. C.

The Cockroach: an Introduction to the Study of Insects. By Prof. L. C. MIALl and ALFRED DENNY. 1886. London: Lovell Reeve & Co. Leeds: Richard Jackson.

THIS work is the third of a series of 'Studies in Comparative Anatomy' by Professor Miall, or jointly by him and collaborators, the two previous ones being upon the 'Skull of the Crocodile' and the 'Anatomy of the Indian Elephant.' No doubt these books will find ready sale among a class of readers who like to obtain their knowledge in as simple form as possible. The one just issued upon the Cockroach treats in popular language of the structure and life-history of *Periplaneta orientalis* and its allies. The volume is liberally illustrated by drawings, some one hundred and twenty-five in number.

The type followed is Professor Huxley's well-known textbook for biologists, 'The Crayfish'; but although that type is fairly imitated, 'The Cockroach' falls short of the model in originality. The authors confess in their preface that some of the figures have already appeared in five articles upon the subject, which appeared in 'Science Gossip' a couple of years previously. We think we may take it for granted that some of the substance of this work also appeared at the same time, for its whole tone is somewhat gossipy, where collation has not been resorted to. Thus, much of the contents of the work under notice has already appeared elsewhere, and in some instances long ago. There can be no possible objection to this style of book-making, for it must greatly tend to a popularity of the study of the structure of various animals, though we doubt if it will make the authors' friends, the Cockroaches, more popular.

The work is divided into eleven chapters and an appendix. The chapters are—I., upon "Writings on Insect Anatomy";

II. and III., upon the "Zoological Position and Natural History of the Cockroach"; IV. and V., upon the "Outer Skeleton, Muscles, &c."; VI., VII., and VIII., the "Nervous, Digestive, and Respiratory Organs"; IX. and X., upon "Reproduction and Development"; and Chapter XI. is upon the "Cockroach of the Past," written by Mr. S. H. Scudder, of the United States Geological Survey. The appendix is divided into the "Parasites of the Cockroach" and the "Sense of Smell in Insects"; both collations.

Of these chapters perhaps the general reader will find most interesting Chap. III., the "Natural History"; and Chap. X., on the "Development of the Cockroach," which latter is by M. Joseph Musbaum, Magister of Zoology, Warsaw.

As examples of the gossip portion of the work we may quote page 20, *Food and Habits* :—

"As to the food of Cockroaches, we can hardly except any animal or vegetable substance from the long list of their depredations,—bark, leaves, the pith of living cycads, paper, woollen clothes, sugar, cheese, bread, blacking, oil, lemons, ink, flesh, fish, leather, the dead bodies of other cockroaches, their own cast-skins, and empty egg-capsules,—all are greedily consumed. Cucumber, too, they will eat, though it disagrees with them horribly."

Again, on page 26, *Parasites* :—

"We have a long list of parasites which infest the Cockroach. There is a conferva, an amœba, several infusoria, nematoid worms (one of which migrates to and fro between the rat and cockroach), a mite, as well as hymenopterous and coleopterous insects. The cockroach has a still longer array of foes, which include monkeys, hedgehogs, polecats, cats, rats, birds, chamæleons, frogs, and wasps; but no single friend, unless those are reckoned friends which are the foes of its foes."

And lastly, on page 27, *Uses*, we find :—

"Of the uses to which Cockroaches have been put we have little to say. They constitute a popular remedy for dropsy in Russia; both cockroach-tea and cockroach-pills are known in medical practice at Philadelphia. Salted cockroaches are said to have an agreeable flavour, which is apparent in certain popular sauces"!

The authority is not given for the latter statement by the authors.

The work will be found useful to all entomologists; and we shall look forward with interest for the issue of other volumes of the 'Studies in Comparative Anatomy' series.—J. T. C.

THE ENTOMOLOGIST.

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[No. 286.]

NOTES ON THE GENUS *LYCÆNA*.

By RICHARD SOUTH, F.E.S.

(Continued from p. 8.)

In my last note the variation of *Lycæna corydon* in England was discussed; reference will now be made to some specimens from the continent of Europe, and remarkable forms from Asia Minor.

I have before me short series of the species from Thuringia and Magdeburg in Saxony, the Swiss Alps and the Pyrenees. All are of the normal type on the upper surface, except the Magdeburg males. These last are of a paler blue than usual, and have exceedingly broad blackish hind-marginal borders to all the wings; the costa is also broadly streaked with blackish. Variation in the character of under-side ornamentation, on the same lines as noticed in English specimens, is exhibited by a few examples in the series from the Pyrenees. Thus a male of the obsolete type would fit in well between the Eastbourne specimens, figured, Pl. I., figs. 1, 2; and a female with confluent spots is very similar to the male represented, Pl. I., fig. 6. In this series are also some fine examples of the var. *syngrapha*, Kef., which would be fairly well depicted by fig. 9, Pl. I., if to this figure were added black discoidal spots and a dash of colour along the costa of fore wings, similar in tint to that of the hind-marginal borders.

As previously adverted to, male *corydon*, from widely separated localities in England, differ somewhat in the tone of their blue

upper surfaces, but on the Continent the species varies in this respect to a considerable extent. In Andalusia, for instance, a form of the male occurs which is much larger than the type, and of a whitish colour, shaded with pale grey in certain lights; the bases of all the wings and the thorax have slight traces of the normal blue colour; the dark hind-marginal borders are generally faint, but the ocelli on the posterior wings are clear and distinct. The black chequers are not very conspicuous in the fringes of the fore wings, and still less so, or even absent altogether, in the fringes of the hind wings. Under sides whitish, with a slight tinge of brown on the inferior wings, and the markings have a faded appearance. The female is pale brown, with black discoidal spots set in pale rings; ocelli and orange crescents on the hind margins of all the wings, and some dashes of the male colour internal to the crescents on inferior wings. Under side rather paler than that of normal female, but all the markings clearly defined.

The local form described above is known as *albicans*, H.-S., and between it and the type are two other pale varieties, viz., *appenina*, L., found in Italy, and *hispana*, H.-S., occurring in Northern and Central Spain. Superficially, *albicans* appears to be a distinct species, but independent of the existence of forms connecting it with *corydon*, we have only to regard the character of the under-side ornamentation when its identity stands revealed.

On mountains in Asia Minor a form of *Lycæna* is found, which in every respect but one is, as far as we can judge from its upper and under surfaces, a variety of *corydon*. I refer to *corydonius*, H.-S. This insect is deep blue, or, according to Staudinger, violet-blue in colour. *Caucasica*, Ld., a variety of *corydon*, found in Armenia, is more like *bellargus* in colour, but has the characteristic markings of *corydon* on both surfaces, and corresponds with *L. bellargus* var. *polona*, Z., which occurs on mountains in Asia Minor, and is of the typical colour, but has the hind margins shaded, as in *corydon*. I possess a male specimen sent me as *corydonius*, from Asia Minor, which does not agree, as regards colour, with the description of *corydonius* or yet with *caucasica*. In some lights this insect appears to have faint traces of *bellargus* colour, but its tint is perhaps best described as pale grey with a blue tinge, though this does not

quite convey a correct idea of the remarkable colour of this specimen. From its under-side markings and the ill-defined broad border on upper surface, I should say that it is a variety of *corydon*. A female example from the same locality has discoidal spots set in pale rings on all the wings, and is in other respects identical with certain Ventnor specimens. It is seen, then, that although typical male *corydon* are easily separated from normal male *bellargus*, varieties of the one are not so readily distinguished from varieties of the other. The females, however, do not appear to vary to the same extent as their consorts; but even in our dealings with normal forms, female *corydon* are not always clearly separable from female *bellargus*.

As regards the larva of *corydon*, its distinctness from that of *bellargus* is not well defined. There are several descriptions of the larva of both species available, but Mr. Hellins' differential synopsis is perhaps the most convenient for reference. Whilst engaged in observing and describing the various stages of *bellargus* larvæ, Mr. Hellins had some plants of *Hippocrepis comosa* sent him from Hampshire, upon one of which he found (June 8th) a half-grown larva, which subsequently passed into pupa, and on the 13th of July produced a specimen of *corydon*. Mr. Buckler, who figured this larva and that of *bellargus*, and Mr. Hellins, who described the latter and critically compared it with the former, were unable to find any material difference between them. The only points of difference were tint of ground and colour of hairs. Thus Mr. Hellins says:—"*Adonis* (*bellargus*) has its ground colour deeper green, with the hairs or bristles black; while *corydon* has the ground colour of a lighter brighter green (a green with more yellow in its composition), and the hairs light brown."*

Distribution.—*L. corydon* occurs in chalk and limestone districts throughout Central and Southern Europe, also in Western Asia. On the Continent there appears to be two broods annually, but in England, so far as I know, there is but one emergence of the imago each year, and this, as a rule, occurs a few weeks in advance of the second flight of *bellargus*. On our South Downs *corydon* is generally well out, some time between the middle and end of July, and continues on the wing well into August; but at Ventnor in 1879, and again in 1883, the only

* 'Larvæ of British Butterflies and Moths,' vol. i., p. 110.

years I had opportunity of seeing the species in that locality, it was not out till late in August, and was noticed in some numbers the first week in September, at which time *bellargus* was also observed. The two species often occur in the same districts, and sometimes even in the same localities in those districts, as instanced above; but I am inclined to suppose that each has its particular settlement or colony. I have been unable to verify this, however, and the information obtained from others upon the point is somewhat indefinite. The few specimens of *bellargus* I have taken (at Ventnor only) were obtained within a short distance of *corydon* head-quarters, and stray examples of the last-named species were in each instance disporting themselves around and about. I first supposed the *bellargus* captured at such times were precocious individuals, and expected that as the number of *corydon* diminished that of *bellargus* would increase; but such was not the case. *Corydon* disappeared from the scene, but it was not replaced by *bellargus*; and I therefore concluded that the odd examples of *bellargus* were, like the *corydon* flying with them, wanderers from their respective head-quarters.

Note.—In referring to the under-side variation (*ante*, pp. 6, 7), I omitted to mention the occurrence of an extra basal ocellus on the inner margins of hind wings, *vide* figs. 7, 10, Pl. I.

(To be continued.)

THE *CRAMBUS CONTAMINELLUS* DISCUSSION; WITH
DESCRIPTION OF *CRAMBUS SALINELLUS*, MHL.

By J. W. TUTT, F.E.S.

AFTER Mr. Tugwell's communication, giving Mr. W. H. B. Fletcher's opinion as to the nomenclature of *Crambus contaminellus*, had been published (*Entom.* xix. 162), I wrote to that gentleman and asked him to work out the matter fully, as I thought it advisable to come to some definite conclusion, and his final opinion would at once dispose of the matter. On November 15th, 1886, following a splendid consignment of the salt-marsh species, I received a letter from Mr. Fletcher, which I consider effectually settles the discussion, and confirms his previous opinion; and as I knew the letter would be most interesting to all collectors of the Crambidae, I have since obtained his permission to publish

it. I may mention that in the following communication, for the purpose of distinction, the Deal and Blackheath species is called *C. cantiellus*, and the salt-marsh (Sussex and Lancashire) species is called *C. contaminellus*.

Mr. Fletcher writes:—"In the box I send about a score of *Crambus contaminellus* (salt-marsh), from which you will learn a part of the range of variation of the species. A part, for some specimens are much more suffused with black scales than any I have sent you. I have one with the whole of the inner half of the wing, except the veins, black, the costal and hind-marginal part being rich light brown. Another specimen is pale wainscot-brown, with a few dark scales dotted about, and without a trace of the transverse lines. It is, however, perfectly distinct from your species. You ask my present opinion as to the nomenclature of the two species; well, let me first state that I am quite certain that *C. cantiellus* and *C. contaminellus* are distinct species. The following are the chief differences that I can see:—

"1. *C. cantiellus* is a smaller and more lightly built insect altogether than *C. contaminellus*.

"2. In *C. cantiellus* the costa is sharply shouldered along the basal third of its length, and then runs more straightly to the apex, which is consequently very sharp; while in *C. contaminellus* the costa is almost regularly arcuated from base to apex (the curvature of the wing of the female being greater than in that of the male), the crown of the arch is beyond the middle of the costa, and the apex of the wing not very acute.

"3. In *C. cantiellus* the ground colour of the fore wings is of a rather redder shade of brown, and not prone to be suffused with black scales, as in *C. contaminellus*.*

"4. In *C. cantiellus* the oblique transverse lines are very narrow, nearly parallel, acutely and irregularly serrated; one of the saw-like teeth of the inner line, about the middle of the wing, is very conspicuous, and in the case of worn specimens, when the rest of the line has nearly disappeared, looks like a central V, with its angle pointing towards the base of the wing. In *C. contaminellus* the inner line starts from about the middle of the costa, curves towards the hind margin, runs very obliquely across

* I am afraid this latter character would not hold good in long series. To me, *cantiellus* is much the darker, and nearly black varieties of both species occur.
—J. W. T.

the wing, reaching the inner margin at about one-third of its length from the base. The outer line starts from the costa rather nearer the beginning of the inner line than the apex, runs about two-thirds across the wing with a full curve, forms a bluntish angle pointing inwards, and then goes with another curve towards the anal angle. Both of these lines are often ill-defined; sometimes one or both are absent; by no stretch of imagination can they be called parallel, nor have I seen a specimen in which there is anything like a central V. In addition to the two lines there is in *C. contaminellus* a more or less conspicuous black streak from the base, running through the middle of the wing as far as the inner line, which often at first sight appears to be lost in it, but can usually be traced beyond it. I dare say I have bred 150 specimens or more, but never saw one in which this longitudinal line was quite absent. On the other hand, none of the *C. cantiellus* you gave me have a trace of it.*

"5. In some of the males of *C. contaminellus*, and to a less degree in a few of the females, there are traces of a dark marginal line on the hind wings. There is no sign of this in the hind wings of the specimens of *C. cantiellus* before me. It might perhaps be seen on some out of a large number of bred specimens,† and is in any case of no value as a character, being so often quite absent in *C. contaminellus*.

"Next to deal with the figures and descriptions:—According to Staudinger and Wocke's 'Catalogue,' p. 220, Hübner figures *C. contaminellus* three times—fig. 59 as *contaminella*, fig. 442 as *inquinatella*, and fig. 364 as *immistella*. Herrich-Schäffer figures it twice—88, male, and 89, female.

"Of these figures we may dismiss Hb. 364. In his copy of the work Prof. Zeller has written under it, '*angulatella* Dup.' = *geniculeus* according to Staudinger. I feel quite certain that, be it what it may, it is nothing like either of the species we are considering. Hübner's fig. 442, *inquinatellus*, and H.-S. 88 and 89, seem to me to be quite clearly the salt-marsh *C. contaminellus*. Herrich-Schäffer's figures are *very good*, but Hübner's wants the basal streak; the shape of the wings, and form and direction of the transverse lines, however, are good. Of course Hübner's

* I have never seen one with any approach to this longitudinal line.—J. W. T.

† In none I have had, some considerable number of which have been very fine, has there been any trace.—J. W. T.

name cannot stand, as it was given much earlier to the species we know by that name.

"The whole difficulty in the synonymy centres in Hübner's *C. contaminellus*, fig. 59. On the whole I still think it represents your *cantiellus*. It is about right in size. The V-mark on the inner transverse line is distinctly, perhaps too much so, represented. The outer line would do for that of either species. The absence of the basal streak, so far as it goes, agrees with your species. On the other hand—I omitted to point out this before—the figure is dotted at its hind margin, as is *C. contaminellus*, while only a few very minute black scales can be seen near the anal angle of the fore wings of the other. The descriptions to which I have access do not help us much. Stainton (Man. ii. 183) says:—'Fore wings ochreous-brown,' which agrees best with the colour of *C. cantiellus*. The ground colour of the other I should say was rather wainscot-brown. I am told that the description was written from Blackheath specimens of *C. cantiellus*. He gives Preston a locality for *C. contaminellus*, but it does not follow that he had any from there before him.

"Zeller's Latin description, 'Chilonidarum et Crambidarum gen. et spec. 43,' refers to *C. contaminellus*. He says, 'Venæ medianæ dimidio basali pallido inferius fusco-marginato,' and 'margine postico medio nigro-punctato.' As a habitat, however, he gives 'pascuis aridis,' so probably he possessed both species,* but only described one of them, not distinguishing them.

"If I may express an opinion on the resultant of this evidence, I should say that I think that *C. cantiellus* is really Hübner's fig. 59, = *C. contaminellus*, Hb., possibly of Stainton†; and that the species, represented by Hübner's fig. 442 as *inquinatella*, and by Herrich-Schäffer's 88 and 89, and described by Zeller, is our salt-marsh *C. contaminellus*, which, if I am right about fig. 59 Hb., requires a new name. This you, as the first to separate the species, have alone the right to bestow.

"After all you are in a far better position to come to a right decision than I am, as, in addition to your knowledge of the species, you have the opportunity of consulting the chief authorities of the day on Lepidoptera, a privilege which one who lives

* Vide 'Entomologist,' xix., p. 73. "Crambus contaminellus in the Zeller Collection."—J. W. T.

† Certainly so; vide Entom. xix. 76.—J. W. T.

entirely in the provinces rarely enjoys. You have no doubt consulted them. It would not surprise me if you came to the decision that, as fig. 59 Hb. is of such doubtful identity, the best course is to ignore it, and to take fig. 442 Hb. as representing *C. contaminellus* (salt-marsh) for the first time unquestionably, with the further result that the other species stands as *C. cantiellus*, Tutt."

After carefully reading this, I think no one, who knows anything about the matter, would doubt that Mr. Fletcher has come to a most satisfactory conclusion, and proved beyond doubt that I was wrong in my synonymy in the first instance. His last paragraph is only his courteous way of qualifying a mature and carefully-formed opinion, and the suggestion concerning Hb. fig. 59 I should not think of adopting. The name *C. cantiellus* will therefore drop through as a synonym of *C. contaminellus*, Hb., fig. 59, and the synonymy of *C. contaminellus* stand as follows:—

Crambus contaminellus, Hb., fig. 59, Sta.
cantiellus, Tutt.

The British localities recorded so far are—Blackheath (specimens, however, have not been captured here, I believe, for some years), Deal, and Shoeburyness (Entom. xix. 27). The time of appearance from the middle of July to the middle of August.

A new name has to be found for the salt-marsh species which is in most of our collections under the name of *contaminellus*. Asking Mr. Fletcher to suggest a name for the insect, he has sent me four names, any of which would be very suitable. As, however, in all our correspondence this insect has been known as the salt-marsh species, I think the name *salinellus* especially applicable to it. The synonymy of the species will therefore be—

Crambus salinellus, Tutt.

inquinatella, Hb., fig. 442.

contaminellus, H.-S., figs. 88 and 89; Zell.; Heinemann.

Mr. Fletcher has not gone into Heinemann's description, but there seems no doubt it refers to the salt-marsh species. The larva of this species has been described under the name of *contaminellus* by Mr. Buckler (Ent. Mo. Mag. xv. 38), and Mr. Porritt (Entom. xix. 130).

The only recorded British localities are—Preston (Lancs.), Coast, and Isle of Sheppy (Entom. xix. 130). Strange

to say, I myself took it last year (1886) in two localities; on the last Saturday in June and the last Saturday in August, from the lamps on Higham Railway Station, whence the insect had probably flown from the adjacent marshes; and during the first week of August, at Deal, on a piece of ground covered by the sea occasionally during the winter. I was very much surprised at the capture of the insect at Deal, on ground which I have closely worked since 1883, and where I have never before seen a specimen. This year I took six one evening, but failed to obtain it when on the same ground several other evenings afterwards.

The insect is on the wing from the middle of June until late in September. Mr. Fletcher wrote me that he had larvæ at the time the imagines began to appear, so that it seems the early moths of one season produce early moths the next season, and the late specimens of one season late ones the following.

I think this effectually disposes of the *contaminellus* difficulty, and brings the matter so far to a satisfactory conclusion, as it clears up what has been a most confusing problem, and at the same time settles beyond doubt the distinctness of the two species which have been previously united under one name.

I now give the following description of *Crambus salinellus*, Tutt:—Expanse, male, 8 to 11 lines; female, 9 lines to 1 in. *Anterior wings* broad, costa regularly arched, apex not very acute; colour wainscot-brown, more or less dusted with black scales; in some specimens the wings are very much suffused; two transverse lines, the *first* starts from about the middle of the costa, curves towards the hind margin for a short distance, and then runs obliquely across the wing towards the body and meets the inner margin at about one-third from the base; the *second* commences on the costa nearly midway between the commencement of the first line and apex, curves towards the hind margin near the upper part, forms an angle pointing towards the thorax at about two-thirds across the wing, and then curves towards the anal angle; a black streak crosses the centre of the wing, longitudinally, from the thorax to the first line, beyond which it is sometimes visible. *Posterior wings* pale grey in colour; in some specimens there are traces of a dark line parallel to the hind margin.

Blackheath, January, 1887.

ON MELANISM.

By T. D. A. COCKERELL.

MR. DOBREE'S paper on this subject (Entom. 25) is certainly most interesting and suggestive, and the facts he brings forward seem to me extremely significant, though the deductions he draws from them are perhaps open to question. From the presence of melanic forms in mountain regions, and in the west of Ireland and Scotland, it seems only natural to suppose that the peculiar features of these regions are responsible for the variation; and of all causes that seem probable from this point of view nothing comes more prominently before us than the extreme mistiness and dampness of the atmosphere. The view that melanism is due to cold has been prominently set forth on many occasions, and, indeed, has in its favour no small share of evidence; yet, as Mr. Dobrée has shown, melanism does not occur in the cold and dry districts of Russia, Siberia and Canada, and does, on the contrary, occur in the much warmer and damper region of Western Ireland.

To further illustrate this argument, I will take a few examples which, though not of insect species, have no small bearing upon the question. It has been demonstrated in the case of *Limax arborum*, a species of slug, Scottish specimens are much darker in colour than English,* and that examples from elevated situations both in Italy and in Ireland are entirely suffused and black in colour, while those from the lowlands are pale grey, spotted or striped.† Another variable slug, *Arion ater*, occurs in dry situations of a brick-red or brown colour, while specimens from damp and marshy spots are almost invariably pitchy black. In both these cases I believe the darkening of colour to be caused, perhaps partly by cold, but certainly in great measure by the humidity of the atmosphere.

Mountain-regions are often enveloped in mist, and here it is that a darkening of colour occurs, as in well-known alpine forms of many Lepidoptera, found constantly in similar situations, as well as many more isolated cases, such as the dark variety of *Acidalia contiguaria* found near Bettws-y-coed.‡ It seems un-

* Roebuck, 'Journ. Conch.' 1885, p. 276.

† 'Zoologist,' 1886, p. 341.

‡ 'Entom.' 1879. p. 67.

reasonable to dismiss Yorkshire melanism as "merely local aberration," nor do I think we need do so, even for the sake of our theory. I do not know the degree of humidity of the Yorkshire atmosphere, but should not be surprised to learn that it is greater than in the southern parts of the kingdom. The black variety of the common field slug (*Limax agrestis* var. *nigra* Butl.) is very frequent about Wakefield and Beverley, and probably elsewhere in Yorkshire, but, except for a single example at Stroud, in Gloucestershire, it has never been known to occur in the South of England, nor has it been discovered anywhere on the Continent. Among Lepidoptera many dark Yorkshire forms are known, notably *Eupithecia albipunctata* var. *angelicata*, Prest., from Selby. Sea-coast specimens are also frequently dark. *Cistela sulphurea*, L., is very dark near the sea, and particularly so at Deal.*

The negro variety of the human race probably had its origin in the very humid, though anything but cold region of Central Africa, and among European races those of damp and maritime countries are darker than the flaxen-haired Teutonic tribes, which came from the dry regions of Central Europe and Asia.

Whether this view will ultimately hold good or not it is impossible to say, but I think it has at least as much in its favour as the others that have been advanced. It would appear that humidity of atmosphere is the main factor in producing melanism, though contact with water, as in the case of aquatic and amphibious species, has no such effect. Much, however, needs to be known, not only as to the geographical distribution of varieties, but also the physical conditions under which they exist; and I would appeal to those who so frequently record melanic and other varieties, not to omit, as they have so frequently done in the past, all notice of the conditions under which the variation occurred. I think that as our knowledge increases, some form of classification by varietal nomenclature will become more and more necessary for the adequate arrangement of our facts, and for convenience sake I should be glad if some varietal name might be adopted which would serve universally for all melanic forms.

5, Priory Road, Bedford Park, Chiswick, February 5, 1887.

* Wollaston, 'The Variation of Species,' p. 60.

PEDIGREE MOTHS.

IN a paper upon Pedigree Moths, read before the London Entomological Society, February, 1887, Mr. Francis Galton, F.R.S., explained the plan and object of his proposed experiments in breeding moths, with the view of obtaining certain hereditary data needed to confirm results gained in the course of previous experimental research, when other subjects than moths were treated.

The substance of Mr. Galton's remarks had, some days before the meeting of the Society took place, been printed and circulated among members; and it is an abridgment of this circular rather than a digest of the paper itself that is now brought before the readers of the 'Entomologist,'—some of whom may not, so far, have heard anything of Mr. Galton's contemplated investigation,—in the hope that some among them may be in a position to assist Mr. Galton in his enquiry, either by furnishing ova of the moth required or perhaps valuable suggestions, the practical outcome of their experience in moth breeding. Mr. Galton says:—

"It is intended in each case to procure broods through a succession of selected specimens, along three lines of descent from a single pair of individuals, so that there would be three parallel broods in each generation. The particular characteristic that is selected for these experiments must admit of being accurately measured, in other respects the choice is immaterial. For brevity of explanation I will suppose it to be *size*. Then, starting from the brood of the original pair:—(1) A few of the largest of either sex would be separated and mated; out of their progeny a few of the largest would again be taken and mated, and so on, for several generations. (2) Exactly the same process just described would be gone through, after substituting throughout the words 'medium-sized' for 'largest.' (3) Similarly, after substituting the word 'smallest' for 'largest.'

"The result will be to obtain a precise measure of the diminution of rate at which a divergence from the average of the race proceeds in successive generations of continually selected animals. The rate during the first few generations is probably the same, whatever may be the characteristic observed (whether

size or anything else), and whatever may be the kind of animal or plant experimented on. It will depend on the amount of the ancestral divergencies, measured with a special and relative unit ('probable error,' as mathematicians call it), that I have often written about, and cannot stop now to describe. This unit enables us to treat on equal terms individuals of either sex, or those in separate broods that have been affected by differences of nourishment, &c. I have shown the rate of divergence to be the same within the limits of statistical error, in the case of (1) weight and size of sweet-peas; (2) human stature; (3) human eye-colour. The course of investigation pursued is necessarily technical. It will be found described in 'Law of Regression' (Journ. Anthropol. Inst., 1885); 'Family Likeness in Stature' (Proc. Royal Soc., 1886); 'Family Likeness in Eye-colour' (Proc. Royal Soc., 1886)."

Acting on the suggestion of Mr. Merrifield, Mr. Galton proposed *Selenia tetralunaria* (*illustraria*) as a suitable moth for his experiment, but the majority of the Fellows, who took part in the discussion following the reading of paper, did not concur in this, and various other British and some exotic silk-producing species were put forward.

What is required is, as pointed out by Mr. Galton, a moth that is "hardy, quickly breeding, of small size, easily measured and preserved, and bearing broods of about 50 to 100 individuals." *Selenia tetralunaria* possesses most of these requirements, but, although it is double-brooded, it can hardly perhaps be called quick breeding. Further, would not the results obtained from the two broods of this insect be almost on a par with those obtained from two distinct species?—*tetralunaria*, the spring brood, would produce *æstiva* (*delunaria*), the summer brood; and *æstiva*, *tetralunaria* certainly; but the comparisons would be, spring brood with spring brood, and summer brood with summer brood. Mr. Galton, however, is of opinion that allowance can be made for any difference in size known to exist between individuals of the seasonal broods.

Size is, no doubt, under the direct influence of nourishment, and is perhaps the only character in the perfect insect that is directly affected by food. As is well known, many breeders of Lepidoptera pride themselves on rearing large specimens, and it is not at all an uncommon thing to see bred specimens of a

species surpassing wild examples in the matter of wing expansion. On the other hand, careless breeders—those for instance who fail to supply their charges with a liberal quantity of food or with a suitable pabulum—rear nothing but under-sized specimens. So we see that it is quite possible to increase or decrease the normal size of a species, even in one generation. To what extent it is possible to increase the size of any given species has not yet been demonstrated, but it is easy to foresee that the limit in the opposite direction would be speedily reached. Probably semi-starved individuals would be incapable of producing fertile offspring, and so such a "breed" would die out with the second generation.

Experiments of this nature do not, however, come within the scope of Mr. Galton's proposed investigation. He only desires to set apart the smallest individuals of a brood on the one hand, and the larger on the other, reserving a selection of the remainder for the medial race. Each race is to be kept apart, and the parents of each of several successive generations to be respectively the smallest of under average-sized race, the largest of above average-sized race, and the medium-sized individuals of the medial race.

In conducting such a course of breeding the larvæ should, properly, be subjected to exactly the same external influences, and supplied not only with the same kind of food, but sprays or branches from the same plant. If this is not done all would not be on equal terms, and descendants of the originally smaller individuals might, by being placed in a more favourable situation and fed on a more nourishing food, attain, or even excel, the size of the descendants of the larger original pairs.

Anyone who may feel disposed to aid in these investigations, upon which questions of considerable scientific value depend, will do well to communicate with Mr. Francis Galton, 42, Portland Gate, London, S.W.; or Mr. F. Merrifield, 24, Vernon Terrace, Brighton.

R. S.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

PIERIS RAPÆ IN CANADA.—In the annual address read before the Entomological Society of Ontario, the following paragraph appears:—" *Pieris rapæ*, although still plentiful, is no longer the terror to cabbage growers it formerly was, its natural enemies having multiplied to an extent sufficient to keep it within some reasonable degree of subjection." It will be remembered that the parasites of this butterfly were collected in Europe, and sent out to North America upon the appearance of *P. rapæ* becoming too numerous after its introduction to that continent.—JOHN T. CARRINGTON.

EUCHLOË CARDAMINES IN AUTUMN.—I noticed, in a late number of the 'Entomologist,' a record of a specimen belonging to the second brood of this species. I have much pleasure in corroborating the statement of your correspondent, for on the 13th of September, 1886, I saw several flying about on the furze-plat near this place. I captured four males and one female, and could have taken several more. Their colour is very bright, and by no means less vivid than in vernal specimens. The occurrence of a second brood of *E. cardamines* is so extremely rare that I shall be glad if any of your readers can offer me an adequate explanation.—SYDNEY HAYLOCK; Rosemont, Maidenhead, January 13, 1887.

RETARDED EMERGENCE OF EUCHLOË CARDAMINES.—In the spring of 1885 I purchased some pupæ of *E. cardamines*, and most of them emerged in the breeding-cage at the usual time during the earlier half of that year. The cage containing the rest of the pupæ, which were supposed to be dead, as also others which were really so, was put away some time about the following December. It was not looked into again until July, 1886, when I was surprised to find that two imagines, one male and the other female, had in the interval come out and died. I believe that such retardation among Rhopalocera is far from usual. Prof. Westwood ('Mod. Class. of Insects,' ii. 349) refers to a notice of similar retardation having occurred in individuals of the genus *Thais*, and speaks of that as "the only instance on record of such an occurrence amongst the butterflies." Noticing this, I venture to address you on this subject. Prof. Westwood published his book

in 1840, but I do not recollect to have met with any parallel record in the pages of the 'Entomologist'; though, in your number for last October (Entom. xix. 247), Mr. A. G. Field asks for an explanation of an individual of the same species (viz., *E. cardamines*), taken on August 18th. Amongst the Heterocera, of course, retardation is not uncommon; two out of four *Dicranura furcula* I have bred waited a year; and your columns contain notices of such delay on the part of *Sphinx ligustri*, *Dicranura vinula*, *Saturnia carpini*, *Eriogaster lanestris*, *Endromis versicolor*, *Cucullia verbasci*, *Emmelesia unifasciata*, *Eupithecia expallidata*, *E. togata*, and probably others.—H. CHITTY; 23, Queen's Gate Gardens, London, S.W., February 21, 1887.

COLIAS EDUSA IN ESSEX.—As I see notices of the appearance of *C. edusa* in 1886 are still being sent to the 'Entomologist,' I write to say I saw two good specimens on October 6th, while partridge shooting near Newport, Essex.—WALDEGRAVE; 13, Montagu Place, Montagu Square, W., February 1st.

COLIAS EDUSA IN SURREY.—On the 27th of August last I met with two *C. edusa* near Oxshott station, Surrey. Both specimens were males in good condition. It is the first time I have seen this species in that locality. None appeared at Kingston last year.—F. V. THEOBALD; Kingston-on-Thames.

SPHINX CONVULVULI IN MIDDLESEX.—I took *Sphinx convolvuli* on August 7th last year, on a fence in Holloway. Several specimens have been taken near.—A. J. FIELD; 145, Isledon Road, Seven Sister's Road, Finsbury Park, N.

PHIGALIA PEDARIA IN AUTUMN.—*P. pedaria* (*pilosaria*) seems to appear much earlier than Newman states. I found one upon a tree on the 15th of December, 1885, at Bedford. As I was only passing through the town I had not time to look for more.—M. ROUTLEDGE; 50, Russell Square, London, Jan., 1887.

THE HABITS OF *TRIPHENA INTERJECTA*.—Mr. Anderson's note (Entom. 41) recalls to me a similar experience of the habits of this species in July, 1880. Prior to that date I had only occasionally taken *Triphæna interjecta* at flowers, and very sparingly at sugar. On a fine afternoon in the first week of July of that year, about 5 o'clock p.m., while walking along a lane leading from this place to New Malden, I was surprised to see this species in profusion, flying wildly about the hedges

in the bright sunshine, and sometimes settling on the flowers of the bramble. Not having any net or boxes with me, I ran home to get them, but on my return to the lane, in the course of an hour, the flight of the moth appeared nearly over, and not many more than a dozen specimens were secured. On the following afternoon the locality was again visited by me, with the object of collecting a long series of *Triphaena interjecta*; although the sunshine was as brilliant, and the air as calm and warm as on the preceding afternoon, not a single specimen was to be seen, nor have I since met with the species in the same locality.—H. Goss; Berrylands, Surbiton Hill, February, 1887.

ON THE "LITA" GROUP OF THE GELECHIIDÆ.—In the autumn of 1885, whilst inspecting Mr. Stainton's collection of Tineina, I was struck by the difference between his series of *Lita maculiferella* and my own. On arriving at home I sent my series to him, and he replied that the two series were unquestionably distinct. I have, therefore, named my species *Gelechia semidecandrella*, from its food-plant *Cerastium semidecandrum*. The larva is yellow, with a black head, and spins up the the shoots, flowers, and seeds of the *Cerastium* in April and May, emerging into the imago state in June and July. It is with us confined to the coast sand-hills. I should be pleased to hear whether the *Lita maculiferella* of Mr. Stainton has been actually bred from hawthorn, or only finds shelter in that plant. Now I take, very sparingly, the imago of *Lita junctella*, not on the sand-hills, but in a very distinct locality, in woods and lanes near the mosses, at Witherslack. The larva of this insect no doubt feeds in summer; the imago emerges in autumn and hibernates, as I have taken worn specimens in spring. The food-plant is unknown, but I strongly suspect seed-capsules of *Stellaria* or *Cerastium*. I will gladly send Mr. Tutt a specimen for inspection. Some seven years ago Mr. Hodgkinson found this species swarming on an old mossy wall at Witherslack in the afternoon sunshine. Is Mr. Tutt sure that the No. 4 in his paper (Entom. 28) is not referable to *Gelechia marmorea*? which I take in many forms, ranging to dark brown and black in some examples. *Lita knaggsiella* was taken rather freely by Mr. Barrett on the trunks of oak trees at Haslemere. No doubt that gentleman will give us full particulars, and also say whether he ever bred it from seed-

capsules of *Stellaria holostea*. I have somewhere read or heard that some continental entomologist bred it from that plant.—J. H. THRELFALL; Ashton, Preston, February, 1887.

LARVÆ OF MYELOIS CERATONIE.—In October last a friend of mine had a sack of rice-cones, in which many reddish larvæ were feeding, which produced about fifty fine *Myelois ceratonie* during November and December last.—W. THOMPSON; 183, Stantonbury, Stoney Stratford, Bucks, February 7, 1887.

FAVOURABLE NIGHTS FOR SUGARING.—I have frequently noticed, particularly last October, that moths come freely to sugar during great gales of wind blowing south-west. On such stormy evenings (sometimes accompanied with heavy rain) I have ventured out, and been most successful. Though not at all a comfortable or an easy experiment, I recommend entomologists to try "sugaring" in a gale of wind. The following are a few captures on stormy nights only:—*Agriopsis aprilina* (several), *Xylina socia* (*petrificata*), *Anchocelis lunosa*, *A. litura*, *Scopelosoma satellitia*, *Miselia oxyacanthæ*, and many other common species. On my return from town, October 8th, I took a male specimen of *Heliothis armigera* at sugar, which is my second capture of this species; the first in 1878; but I know of no other from this district.—J. M. ADYE; Somerford Grange, Christchurch.

PRESERVING INSECTS.—Between three and four years ago, in spite of a good supply of camphor which was always kept in my boxes, I lost some hundreds of specimens of insects through the attacks of those horrid pests, the mites, finding on some of the boards little else but a heap of dust, where a short time before no traces of mites were to be seen. With regard to Mr. Dannatt's note (*Entom.* 43), I feel great pleasure in giving the particulars he asks concerning the use of corrosive sublimate, which may prove welcome to others of your readers at the same time. There are two ingredients only,—twelve grains of powdered corrosive sublimate dissolved in two ounces of methylated spirits of wine, or forty-eight grains dissolved in half a pint of the spirit. This will be found the exact strength for the purpose of preserving specimens. With regard to the use of the poison, pour the mixture into a shallow basin, or any vessel of this description; then take the insect, which must be quite dry, by the pin with a pair of forceps, and hold it completely sub-

merged in the solution while you can count six; then take it out and shake it gently, and take off the superfluous drops at the tips of the wings with blotting-paper. Then place the specimen on a window-sill to dry, lifting the sash about an inch or so, where a strong draught can be obtained; this is necessary to keep the scales from setting in a mass. Put the insect in a position so that the wind can blow from the tail to the head. I find that insects covered with long down are best treated by holding them by the pin in the left hand, and then with a camel-hair brush dipped in the solution touch the under side of the bodies and wings until they become saturated with the poison. Insects treated in this way are perfectly proof against all depredators. Mould will not affect them, neither will mites, nor the larvæ of several beetles and "clothes-moths," which at other times destroy so many specimens, to the chagrin of the collector. It is better for beginners preserving Lepidoptera to practise a little while on very common species, so that they will not be afraid of spoiling specimens of any value.—THOMAS HILL; 15, Russell Street, Willenhall, February 7, 1887.

[Pure alcohol should be used instead of methylated spirits, because the latter is prepared with a solution of gum, which becomes deposited all over the insect, as well as the sublimate, on the evaporation of the spirit being completed. The treatment recommended by Mr. Hill is doubtless effective, but should be used as little as possible, as it always more or less injures the specimens. The use of naphthaline in the boxes or cabinet drawers is far preferable to all other deterrents, for camphor is by no means effective, and frequently causes dried insects to become greasy.—J. T. C.]

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. *February 2nd, 1887.*—Dr. D. Sharp, President, in the chair. The President nominated Mr. Robert M'Lachlan, F.R.S., Mr. Osbert Salvin, M.A., F.R.S., and Mr. Henry T. Stainton, F.R.S., Vice-Presidents during the Session 1887-1888. The Rev. W. J. Holland, M.A., of Pittsburgh, United States; Dr. F. A. Dixey, M.A., Fellow of Wadham College, Oxford; Mr. C. J. Gahan, M.A., of Brompton,

S.W.; and Mr. Sydney Klein, F.R.A.S., of Willesden, N.W.; were elected Fellows. Mr. P. Crowley exhibited a new species of *Synchlœ*—*S. Johnstoni*—from Kilima-njaro; also, for comparison, specimens of *Synchlœ mesentina* and *S. hellica*, which the new species closely resembled. Mr. W. White exhibited a number of preserved larvæ of European Lepidoptera in various stages of growth,—including nine examples each of *Saturnia carpin*i and *Deilephila euphorbiæ*,—illustrating the gradual development of the markings and colours, as explained by Prof. Weismann, in his 'Studies in the Theory of Descent.' Mr. Gervase F. Mathew exhibited a variety of a female of *Lycæna telicanus*, from the neighbourhood of Gallipoli, Turkey: also some specimens of a *Lycæna* from Vigo, believed to be varieties of *L. baton*, but differing from the type in being much larger and darker. He further exhibited several examples of a *Leucophasia* from Vigo, which appeared to be identical with *L. æstiva* (Staud.). Mr. Porritt exhibited, on behalf of Mr. N. F. Dobrée, a series of a remarkable red form of *Teniocampa gracilis*, bred last season from larvæ collected in Hampshire. Mr. Eland Shaw exhibited specimens of *Pachytylus cinerascens* (Fab.), *Mecostethus grossus* (Linné) and *Gryllus flavipes* (Gmel.), and read a "Note on the Identity of *Gryllus* (*Locusta*) *flavipes*, Gmel." The Secretary read a communication from Prof. Riley, of Washington, on the subject of the "Australian Bug" (*Icerya purchasi*). It was stated that the insect had of late years become very destructive to various trees and shrubs in California, into which country, as well as into New Zealand and Cape Colony, it had been introduced from Australia, where it was believed to be indigenous; but on this point further evidence was asked for. The Rev. T. A. Marshall communicated "A Monograph of the British Braconidæ," Part 2, being a continuation from Part 1 of the 'Transactions' for 1885. Mr. Francis P. Pascoe read a paper entitled "Descriptions of some new species of *Brachycerus*." Mr. Francis Galton, F.R.S., read a paper on "Pedigree Moth-breeding as a means of verifying certain important Constants in the General Theory of Heredity." In this paper Mr. Galton suggested the institution of a system of experimental breedings, to be continued for several years, with the object of procuring evidence as to the precise measure
e diminution of the rate at which a divergence from the

average of the race proceeds in successive generations of continually selected animals. Mr. Frederic Merrifield read a paper (by way of an appendix to Mr. Galton's paper) entitled "A proposed method of breeding *Selenia illustraria*, with the object of obtaining data for Mr. Galton." Mr. M'Lachlan said he considered the fact that *S. illustraria* was dimorphic an objection to its selection for the experiments proposed, and he suggested that the common silkworm moth, or some other large Bombyces, would be more suitable for Mr. Galton's purposes. Professor Meldola called attention to some observations on *Selenia illustraria* by Dr. Knaggs in vol. iii. of the Ent. Mo. Mag., which had some bearing on the projected experiments; and he remarked that, although for some reasons the species selected was well adapted for testing Mr. Galton's conclusions, he believed that the fact of the moth being seasonally dimorphic was likely to introduce disturbing elements into the experiments which might influence the results. The discussion was continued by Dr. Sharp, Messrs. Baly, Kirby, White, Klein, Porritt, Dunning, Waterhouse, Bates, Merrifield, Galton, and others.—H. Goss, *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*January 27th, 1887.* R. South, Esq., F.E.S., Vice-President, in the chair.—Messrs. F. H. Barclay and C. Roberts were elected members. Mr. J. J. Weir exhibited *Nilasera pirama*, Moore, and *N. amantes*, brilliant butterflies from Ceylon; also a piece of amber containing three specimens of Chrysomelidæ, one of Coccinelidæ, and one of Orthoptera. Mr. Billups exhibited living specimens of *Rhagium bifasciatum*, Fab., from Braemar, and contributed notes. Mr. J. Jenner Weir communicated a paper entitled "Notes on the comparative rarity of Lepidoptera-Rhopalocera once common in the neighbourhood of Lewes." The following is an abstract:—

"In presenting to the Society this evening a copy of my friend Mr. J. H. A. Jenner's list of the 'Macro-Lepidoptera of East Sussex,' I deem it a fitting opportunity to make some remarks on the present scarcity, in that district, of several of the species of Rhopalocera which in my young days, half a century ago, were frequently, or even commonly, met with.

"*Aporia cratagi*.—Mr. Jenner states, 'Formerly at Holmbush Henfield.' When about the year 1838 I first in earnest commenced to make a

collection of the British Lepidoptera, I was visiting my relations in the month of June at Keymer, a parish situated between the Burgess Hill and Hassocks Gate Stations of the London and Brighton Railway, I sent to my uncle, the late Mr. Auckland, of Lewes, for a net, and he very kindly gave me the first I possessed; he was himself an entomologist, and I may say that it was mainly owing to him that I took up the study. As soon as I had obtained the net I went into a field at the back of the house, and the first insect I took was *Aporia crataegi*, and it was very abundant; probably I might have very easily taken a hundred specimens. This by no means surprised me, as Mr. Auckland had often told me that he had always obtained it in that neighbourhood for many years in succession. Being a young beginner, and feeling sure of taking it in after years, I captured but a moderate number: of these one still remains in my cabinet. There was a small mill-stream ran in front of the house; the sides of this were well-wooded, and there the insect abounded. I visited Keymer the next year, then intent on taking more *A. crataegi*; I saw but one, and this I still possess. For some fifteen years I was often at Keymer, but never did I see the insect again; and I believe that now I am the only Sussex entomologist living who has ever seen the species in plenty in that district, and it appears from Mr. Jenner's note that the insect is extinct in the county.

"Mr. Auckland's note, which I have before me, gives as localities, 'Chailey, May 30th, 1834; Newick, June, 1835; Lindfield, June, 1836. My own opinion is that in the earlier decades of the century a flight of this insect visited Sussex from some part of the Continent, and that our climate has not been favourable to its permanent establishment, and that it has gradually become extinct.

"*Aporia crataegi* has disappeared almost entirely in the New Forest, where I have taken it myself, and where it was at one time very abundant. It first became rare in the eastern parts of the Forest; it probably still lingers in the western parts, where I have taken it of late years, but in 1886 I could not hear that one had been seen.

"*Leucophasia sinapis*.—Mr. Jenner's note of this species is 'Very scarce and apparently extinct in many localities where formerly found.' This is quite in accordance with my own experience: it used to be taken by my uncle near Lewes in 1834, where it is now extinct, and, although I often visit Abbot's Wood, and have done so for years past, I never found it there. This appears to me to be a case of an indigenous insect becoming extinct in certain parts of Sussex, which, from the weakness of its flight, was not likely to have flown over from the Continent, as might have been the case with *A. crataegi*, a gregarious insect, which *L. sinapis* is not.

"*Melitæa aurinia*.—Of this species Mr. Jenner's note is 'Local and rare, Chailey and Ringmer.' I have sought in vain for this insect in

Sussex; it was at one time very abundant at Chailey, the home of my ancestors. I recollect that some school-children brought over to Mr. Auckland from thence a clothes'-basket covered with pinned specimens of *M. aurinia*; there were about 400. Mr. Auckland's note is as follows:— 'Abounded at Chailey from 8th May to June, 1834; I had sent me many hundreds.'

"*Vanessa c-album*.—Mr. Jenner notes it as 'Very rare; once at South-over, Lewes; Guestling, rare; Tilgate.' I have never taken this species in Sussex, but in the hop-gardens it was once common, so much so that the peasants had a local name for it, viz., the 'silver bug.' An aged relation of mine has often described the species to me as being very well known, but, although he made every endeavour between thirty or forty years ago to obtain the larva for me, he found it was extinct. He himself, a grower of hops, was very observant, and his testimony is therefore of value.

"*Vanessa polychloros*.—Mr. Jenner says, 'Local and less common than formerly.' I have scarcely seen this insect in Sussex for thirty years; it was at one time common near Lewes, and my series was taken at Keymer.

"*Melanargia galatea*.—Mr. Jenner says, 'Local, near Lewes (formerly); Firle Beacon.' This is another singular case of the disappearance of a lepidopteron once common near Lewes. At one time it appeared year after year at Oxsettle, near Lewes; I have not seen it there for over forty years. Mr. Auckland notes that this species was taken by him at Plashet Wood, Chailey, and Warningore Wood beginning of June.

"*Pararge egeria*.—'Woods and shady lanes; not common, but generally distributed' (Jenner). This species is yearly becoming rarer. Mr. Stanton Hillman, of Lewes, informs me that he has not seen one for years. In my younger days it was common.

"*Lycana ægon*.—'Local; Brighton, Hayward's Heath, Lewes, Chailey, Tilgate Forest' (Jenner). This insect was common at one time on Cliffe Hill, Lewes. I find in my notes that on June 8th, 1844, I took fifteen. Mr. Auckland notes it as found there during the months of July and August. It has now quite disappeared from that locality; I have not seen it there for at least forty years.

"With this I conclude my notes. As to the causes of the progressive rarity of the seven latter species mentioned I cannot hazard even a conjecture; but I feel tolerably certain that it has not been brought about by the entomologists, although in some instances man may be the cause, owing to the cultivation of the soil and the eradication of the food-plant of the species."

At the close of the paper a long and interesting discussion ensued. Mr. Tugwell said some years since he had taken *Aporia crategi* at Herne, a village near Herne Bay, in profusion, but it was no longer there. Mr. Chaney said that *A. crategi*

was at one time very abundant near Rochester, and, in fact, all over the Hundred of Hoo, but disappeared about the year 1871; *Leucophasia sinapis* used also to be common in a wood the other side of Chatham, but after the year 1856 it gradually became scarcer and scarcer, and about the years 1858 or 1859 disappeared altogether. Mr. Carrington thought that there was a general scarcity of butterflies all over the country, and this, in the northern counties at least, he attributed to the severe winter of either 1878 or 1879, when the cold was phenomenally intense, probably killing the insects, which were absent to a great extent afterwards. The discussion was continued by Messrs. Tutt, Frohawk, South, Rendall, Sheldon, and others.

February 10th. R. Adkin, Esq., F.E.S., President, in the chair.—Messrs. H. Collings and L. F. Hill were elected members. Among the entomological exhibits Mr. Samuel Stevens brought a remarkable variety of *Vanessa atalanta*, L., and a suffused variety of *V. io*, L.; Mr. R. Adkin, *Spilonota incarnatana*, Hb., bred from larvæ found in shoots of *Rosa rubiginosa*, in the heart of Surrey, forty miles from the coast; Mr. C. A. Briggs, a large number of *Lycæna corydon*, in reference to the paper now appearing in the 'Entomologist' upon the genus *Lycæna*, including dwarfed forms, blue and brown forms of the female, varieties with the spots absent from the under side or in excess of the usual number, and running into streaks; Mr. R. South, species of British and foreign Lycænidae, and contributed notes, calling particular attention to a variety of *L. corydon* from Asia Minor, which, as far as he could remember, was similar to the varieties exhibited by Mr. Sabine at the Society's meeting, October 7th, 1886, who had stated that he had seen *L. bellargus* and *L. corydon* in copulâ. This Mr. South said was quite possible, and he was of opinion that this variety was hybrid between the two species referred to. Mr. Hall remarked that he had had an opportunity of examining Mr. Sabine's varieties, and thought they were very similar to the variety now exhibited. Mr. Tutt observed that he thought the specimen referred to was simply a local form of *corydon*. Mr. E. Joy exhibited Lepidoptera from the New Forest. Mr. John T. Carrington read a paper, "Hybernation and Æstivation," upon which a lengthy discussion of a most interesting character took place.—
H. W. BARKER, Hon. Sec.



H. Knight adnat

West, Newman & Co. ch

The Genus *Lycæna*.

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NOTES ON THE GENUS *LYCÆNA*.

By RICHARD SOUTH, F.E.S.

(Continued from p. 52.)

FIRST, a word concerning *Lycæna corydon*. Prof. Blachier, of Geneva, has most kindly informed me that the variety, Pl. I., fig. 1, has been named *lucretia* by M. Garchet ('Annales de la Société entomologique de France, 1877,' bulletin, p. 79). Such a remarkable form is certainly worthy of a distinguishing appellative. Prof. Blachier also mentions a small grizzled (grisâtre) example of *corydon*, which was taken in the Valais, and expands only 27 mm. Mr. C. A. Briggs has British specimens even smaller than this; two (male and female), which he has most courteously shown to me, measure respectively 25 mm. and 22 mm.

PLATE II.

Lycæna icarus, Rott.

alexis, Hüb.

UPPER SURFACE.

Male.—Blue, with either a tinge of violet or mauve, more frequently the latter. The specimens figured, Pl. II., figs. 1, 2, 3, have each a distinct shade of blue: that represented by fig. 1 is from Aberdeenshire, and is blue shot with mauve, while fig. 2 shows a male *icarus*, closely approaching male *bellargus* in colour; and fig. 3 is a decidedly violet specimen. These two last are from Ireland, and were kindly sent me, together with others (to which more particular reference will presently be made), by Mr. Percy Russ, of Culleenamore, Sligo. Several of the males

from Sligo exhibit a tendency to the *bellargus* coloration, but the one figured is the most decided. The only other locality from which I have seen similar examples is the Isle of Hoy, but these are not quite so striking as the Sligo specimens, and the *bellargus* colour is mostly confined to the inferior wings. In typical *icarus* the hind margins of all the wings have a linear black border; this in English specimens does not usually attract one's attention, but in Scotch and Irish examples it is sometimes very conspicuous. The nervures are generally pale shining blue, but in some specimens they are dark coloured towards the hind margin of the wings (Pl. II., fig. 1), and in a few instances are continued beyond the marginal border into the fringes, giving to these latter a slightly chequered appearance. There is no discoidal spot on either fore or hind wings, but the discoidal and other ocelli of the under side are often visible from above. In a few of the Sligo specimens there is a distinct row of black spots on the inferior wings internal to the marginal border. These are seen in fig. 3, Pl. II., but in other examples they are large and distinct. Mr. Russ informs me that specimens of male *icarus* with black spots are of constant occurrence in his locality.

Female.—The form of this sex most frequently met with has all the wings brown, tinged with blue at their bases. On the fore wings is a black discoidal spot, and a series of orange crescents internal to a row of black spots on the hind margins. The hind wings have a marginal row of black spots, which are bordered externally with white and internally with orange. Fringes white. One of the most common forms of "blue" female *icarus* (var. *cærulea*) obtained at Ventnor is that figured, Pl. II., fig. 9. Three others from the same locality are, except in size, similar to the Sligo example, Pl. II., fig. 11. Between these two types there are among the Ventnor specimens several most interesting forms. Some of these have the discoidal spot on fore wings surrounded with whitish-blue, and in others the discoidal cell of the inferior wings is closed with a small black dot set in a whitish-blue ring. Others, again, have a whitish-blue triangular streak internal to the third and fourth orange crescents on hind wings. In nearly all these specimens the orange markings of the primaries are either very faint or entirely absent. Some female *icarus* from Pitcaple, Aberdeenshire; and others from Castletown, Co. Cork, Ireland, the latter kindly sent for my inspection by

Mr. Gervase Mathew, are very handsome. The blue, which in these specimens is of a violet tint, suffuses nearly the whole of the wings up to the large and bright orange crescents. These last are almost confluent, and consequently the orange marking appears band-like, as shown in the Scotch example, Pl. II., fig. 6. This particular specimen, however, is only tinged with blue at the bases of the wings, and was figured more especially to show a curious modification of the whitish-blue triangular streak, adverted to above, but which unfortunately does not appear in the colouring.

UNDER SIDE.

Normally the under surface of male *icarus* is pale grey, with a brown tinge on inferior wings; and that of the female pale brown. The ocelli are alike in both sexes, and in their arrangement very similar to those on the under side of *corydon*, referred to (*ante*, p. 5). On the inferior wings a white streak starts from the third and fourth hind-marginal orange crescents, and passes between the fourth and fifth ocelli of the central series.* In several male specimens from Sligo the under side coloration is of a pale fulvous brown (Pl. II., fig. 4), and a few examples of the same sex from Ventnor are of a somewhat similar tint.

With regard to variation in the ocelli, all the leading forms of aberrations noticed in *corydon* (*ante*, p. 5) are found in *icarus*.† The obsolete type, however, is only represented in my collection by the form *icarinus*,‡ Scriba (Pl. II., fig. 4, Sligo; fig. 5, Ventnor). I have taken this aberration in North Devon, Kent, Surrey, and Isle of Wight, and have received it from Scotland and Ireland.§ Among my Ventnor specimens of *icarus* are several examples of the increscent form. In some of these the upper basal spots of the fore wings are elongated, and the lower completely divided; others have four, and one example five,

* Stated to pass between fourth and sixth in *corydon*; but this is only in exceptional cases, where the streak is broad and encloses the fifth ocellus. It usually passes as in *icarus*, between the fourth and fifth ocelli.

† I have seen in collections many interesting under side aberrations, and all, except perhaps sundry deformed examples, belonged to one or other of the principal types adverted to.

‡ Absence of the basal spots on fore wing is the distinguishing character of *var. icarinus*, but in several specimens the last spot of central series has vanished also (Pl. II., fig. 5).

§ Mr. Russ, Sligo; Mr. Mathew, Castletown.

distinct basal spots on each fore wing; and others have an extra ocellus on inner margin of hind wing. Several of the confluent spot aberrations are similar to that of *corydon*, Pl. I., fig. 6; others have the initial spot of basal and central series on hind wings united.

Most of the Scotch and Irish specimens and two from Ventnor have clear discoidal spots on hind wings, and in one Scotch example the discoidal spot of fore wings is also white. The white streak on the hind wings sometimes extends almost to the discoidal cell, as in the Scotch female example figured, Pl. II., fig. 7; and in two Ventnor specimens this streak joins the second basal ocellus. A curious feature* in connection with all the Sligo *icarus* that I have seen, and some of the Scotch examples, is that the hind margins of both fore and hind wings are much paler than English examples. This is particularly noticeable in one of the males from Sligo, the whole of the margins external to the orange crescents being pure white. Fringes of the male are white, as on the upper surface, but of the female pale grey; and the venation of both sexes is dark coloured and distinct on the hind margin. In some examples this dark colour is projected into the fringes (*vide* Pl. II., fig. 7).

English *icarus* varies considerably in the matter of wing expansion. Thus, for instance, I have female specimens from Folkestone, taken early in August, which range from 0.75 in. to 0.85 in. The example figured, Pl. II., fig. 8, but slightly exceeds three-quarters of an inch, while among the Ventnor specimens are males from 1.30 in. to 1.40 in. From a large number of measurements I have taken of both sexes of *icarus*, from various parts of England, I find the average to be—male, 1.20 in.; female, 1.10 in. Both sexes of Irish and Scotch are uniformly larger than English specimens. Some males from Sligo expand 1.50 in.

In my collection are specimens of *icarus* and var. *cærulea* from Thuringia and the neighbourhood of Leipzig, and typical *icarus* and var. *icarinus* from two localities in Switzerland. As regards the upper and under surfaces of the type in each series, I can only say that although the Thuringian males are rather more shaded with mauve than the Swiss examples, all are

* Not clearly shown, I regret to find, in the figure of *icarinus* from Sligo, Pl. II., fig. 4.

eminently typical. The specimens of var. *cærulea* are not so brightly blue as many English examples of this form of the female, and I am given to understand that in Switzerland the females do not often assume the male colour beyond a basal suffusion.

Mr. Gervase Mathew has been good enough to show me examples of *icarus* from Vigo, North-West Spain; and Turkey. The three males from the Spanish locality are of the average size, but are rather darker in tint; the hind-marginal borders are strongly defined, and in one specimen there are indications of dark spots on the margins of hind wings; on the under surface the colour is more like that of typical female than male. The series from Turkey comprises four males and one female. In colour these males are somewhat different to any I have seen from other parts. The tint may be described as pale blue-mauve, but in one example there is a decided shade of the *bellargus* colour on the inferior wings. This specimen has the hind margins of fore wings more rounded than usual. Another example, the smallest of the series, has dark spots on the margins of hind wings. Female of the normal type.

Var. *celina*, Const., from Algeria, is by some entomologists considered a distinct species. I have only a pair of this insect. Male.—Under the average size, of the *bellargus* colour, with a shade of mauve, but in certain lights there is a suspicion of the *eros* tint; marginal borders are black, and a little broader than in typical *icarus*; the nervures black on the hind margins of all the wings, and there are two or three small black spots on margins of hind wings. Fringes white. Female.—Brown, tinged with blue at the bases of the wings; discoidal spot on fore wings large and black; bright orange spots on the hind margins of all wings. Under side.—All the markings quite like those of *icarus*, but bright and distinct; and the female has the extra ocellus on inner margins of hind wings.

Var. *persica*, Bienart. I have not seen an example of this Persian form, but Dr. Lang says* it "has the spots on the under side very small or absent."

Distribution.—*L. icarus* is found throughout Europe, Northern and Western Asia as far as the Himalayas, and North Africa.

* '*Rhopalocera Europæ*,' p. 143.

Lycæna bellargus, Rott.
adonis, Hüb.

The following observations concerning British examples of this species refer to a long series received from Folkestone, the majority of which were captured and sent to me in September, 1885.

The male of *bellargus*, like the same sex of the two species previously considered, is not constant in tint of upper surface. Some few specimens have a decided shade of mauve in their coloration. The fringes of fore wings of all the specimens are chequered with black, but this character is not clearly expressed in hind wing fringes of a few examples. The black spots on the hind margins of inferior wings are fairly distinct as a rule, but in one or two individuals are not even indicated.

Some of the females received in 1885 are dark brown, with a black discoidal spot on fore wings and deep orange crescents on the hind margins of all the wings of one or two specimens, but on the inferior pairs only of most of the examples. In many cases the crescents are confluent and form a band on the hind wings, but in others, on the contrary, they are very faint. Discoidal spot of primaries, in a few specimens, encircled with whitish-blue. Three examples have a small discoidal spot on hind wings also surrounded with whitish-blue. These last are the only specimens which have distinct discoidal spots on inferior wings. Among many females which have assumed more or less of the male colour are one or two similar to the example figured Plate II., fig. 10, and two others approach the var. *ceronus*, Esp., Plate II., fig. 12,* but lack the orange crescents on fore wings. They are, however, similar to examples of *ceronus* from Magdeburg.

Under side.—The males are very like the same sex of *icarus*, but generally rather darker in colour. The colour and ornamentation of female seems intermediate between *icarus* and *corydon*. Though more closely resembling the former, it may usually be distinguished therefrom by its chequered fringes, whilst from the latter it is separated by its more glossy appearance.

The obsolete, increscent, and confluent phases of aberration are each represented. Nearly all the examples have clear white

* After Dr. Lang's figure of *ceronus*, 'Rhopalocera Europæ,' Plate XXVI., fig. 5. The colours are somewhat brighter than in the original.

discoidal spots on hind wings, and the white triangle is more or less distinct.

Among some Swiss examples of *bellargus* in my collection is a male from Jura, which is distinctly tinged with mauve. This colour is also noticeable in males from Prussia, and the black spots on the hind margins of inferior wings are rather large. The chequered character of the fringes in one or two examples from the Continent is faint. Most of the females are very typical throughout. The exceptions are examples of *ceronus*, previously adverted to.

In English specimens of *bellargus* the marginal spots, when present at all on the hind wings, vary considerably in size. In some Algerian specimens of the species this character is unusually well developed. The male of this form, known as *punctigera*, when held in a certain position appears to have the colour of *icarus*, and the resemblance to this species is rendered more complete by reason of the nervure-points running into the white fringes in a similar way to that noticed in *icarus*. Only in *punctigera* the black colour is carried through to the tips of the fringes; but it does not, however, form patches as in typical *bellargus*, at least not in my examples.

Var. *polona*, Z., as adverted to when discussing the named varieties of *corydon*, has the typical male colour, but is larger than the type, and has the hind margins somewhat broadly bordered with black. The specific identity of this form depends, more especially perhaps, on the character of its under side ornamentation, which is more like *bellargus* than *corydon*. It is found on mountains in Asia Minor.

In var. *cinnus*, Hüb., 830-1, the spots on the under side of posterior wings are not ocellated.

Distribution. — *L. corydon* occurs in Central and Southern Europe, Western Asia, and North Africa.

Mr. Sabine has been good enough to send me, for examination, some of the curious forms of *bellargus* he took at an inland locality in Kent.* As there may be similar forms in other cabinets it will perhaps be well to give short descriptions of each of these varieties, and also of two others from Folkestone, kindly shown to me by Mr. Sabine.

* Entom. xix. 176, 248.

Taken in June, 1886. Kent:—

No. 1, ♂.—Grey, with a brownish shade and a very faint tinge of blue. Ocelli on hind margins of hind wings faintly indicated. Under side, normal *bellargus*.

No. 2, ♂.—Grey, with pale mauve shade. Fringes faintly chequered with pale grey. Black spots on hind margins of inferior wings indistinct. Under side as in *bellargus*.

No. 3, ♂.—Central area of all wings mauve, with *bellargus*-blue margins. Nervures black on hind margins of fore wings. Black spots on margin of hind wings. Fringes faintly chequered on fore wings, but plain white on hind pair. Under side, normal *bellargus*.

No. 4, ♀.—Pale brown, shot with pale blue at the bases of all the wings; a band-like series of orange crescents on hind margins. Fringes white, with only faint traces of chequers. Under side very like some examples of *icarus* with clear white discoidal spots on hind wings.

No. 5, ♂.—Blue-black, with small black spots on the hind margins, and a dash of brownish colour along the inner margins of hind wings. Nervures black, running through the whitish fringes. Under side.—Fore wing smoky-grey. Hind wing smoky-brown. Spots arranged as in *bellargus*, but enclosed in rings, which are but little paler than the colour of the wing upon which they are placed. The discoidal spot of hind wings is pale, but ill-defined.

Specimens taken in same locality as above, September, 1886:—

No. 6, ♂.—Pale brown, with a faint tinge of blue and indistinct ocelli on the hind margins of all the wings. Under side similar to that of *bellargus*, but the black spots are very small.

No. 7, ♂.—Appears to be *icarus* on the upper surface, with a tinge of *bellargus* colour; but the nervures, which are blackish on hind margins of the wings, run through the fringes. Under side identical with that of *bellargus*.

No. 8, ♀.—Similar on the upper surface to No. 4, but the orange crescents are less distinct on the fore wings. Under side, typical female *icarus*.

Aberration taken near Dover, spring, 1883:—

No. 9, ♂.—Greenish-blue, with a blackish shade or border on hind margins of fore wings, and faint black spots on margins

of hind wings. Fringes of fore wings slightly chequered; those of hind wings plain white. Under side, typical *bellargus*. From the upper side alone it would be difficult to say which species this example should be referred to; but judging by the under side one would suppose it to be a variety of *bellargus*. The colour of the upper surface, although not exactly that of either *corydon* or *bellargus*, has something of each in its composition; the hind-marginal border is suggestive of *corydon*.

Aberration taken at Folkestone, Autumn, 1884:—

No. 10, ♂.—Blue-black, somewhat darker in hue than No. 5. Fringes chequered, dark grey and black. Under side similar to No. 5, but the discoidal spot of hind wings is obliterated.

In the note on *icarus* reference is made to a tendency exhibited by some specimens to assume *bellargus* colour, but such examples are not in any way to be considered as parallel varieties to the aberrations just noted.

That the examples Nos. 1—8 are hybrid, or, perhaps more correctly, mongrel offspring of a union between *icarus* and *bellargus*, there can be little doubt, I think. Believing as I do that *icarus*, *corydon*, and *bellargus* are not pure species, I can readily admit not only the probability of a fertile crossing between *icarus* and *bellargus* or *bellargus* and *corydon*, but the further possibility of the issue of any such crossing being capable of reproduction. Of course mongrels would be fertile, but the chances of their pairing among themselves would be infinitely small compared with the probabilities of union between mongrel and either parent form. We may, therefore, venture to conclude that, under existing circumstances, the mongrel character of the offspring of a chance crossing between *icarus* and *bellargus* would not be reproduced to any extent, but that on the contrary it would soon be lost again in the type form of *bellargus*. Some of the issue of these intercrossings might resume certain long-lost characters, and the blue-black form may be an instance of such reversion.

It has been suggested to me by entomologists who have had much experience with both species in Britain that a union between *bellargus* and *corydon* is not possible, because the first brood of the former has passed away before *corydon* appears, and this last insect has run its course before the second brood of *bellargus* emerges. In my remarks on *corydon*, however, I mentioned that the two

insects had been observed by me, more than once, flying together. The *bellargus* in each instance were of the second brood. Now what has happened at one place may reasonably be expected, under similar conditions, to occur at another place; and I cannot see why *bellargus* should not be contemporary (in certain years) with *corydon* in Kent, as well as in the Isle of Wight.

As far as I know, the sterility of a cross between *bellargus* and *corydon* has not been demonstrated. Have we any proof that the pairing of *icarus* and *bellargus* is, as regards progeny, inoperative?

Lycæna hylas, Esp.

dorylas, Hüb.

"Fringes of all the wings white. Male bright blue, with a narrow brown hind marginal border; along the hind margin of the hind wings is a row of not very distinct brown spots. The female, above, very closely resembles that of *L. icarus*, but the wings are darker brown, the orange band on the fore wings less distinct, and the white marginal fringe broader. Beneath, the wings somewhat resemble those of *L. icarus* var. *icarinus* (the fore wings having no basal spot). It differs, however, in having the orange bands paler and less distinct, in the greater size of the black spots on the fore wings, and in having the discoidal spot on the hind wings white, without any, or with a very minute, central dot."—'Rhopalocera Europæ,' p. 122.

Male.—The description of male *hylas*, as given above, applies very well to some Swiss examples of the species in my collection, except perhaps as regards the hind-marginal border and spots; these, I should say, are black rather than brown. In some specimens from the neighbourhood of Vienna the border is brown, but the blue colour of the wings has something of a green tint. One of the Swiss examples is a beautiful "peacock-blue"; this specimen and another from the same locality have no trace of black spots on the margins of hind wings.

Female.—The females from Vienna are dark brown, but not darker than female *icarus* from Saxony, or even some Isle of Wight specimens. The orange crescents on the fore wings of a few examples from Switzerland and Vienna are quite as distinct as in certain English and Swiss *icarus*.

Under surface.—The most striking under side character of the coloration, which varies in the male from pale grey or

whitish to pale brown, and from pale to dark brown in the female. This colour never passes beyond the hind-marginal crescents. The margins of all the wings, external to the crescents, are white, with a row of ill-defined dots. As has been adverted to, the under side of Irish male *icarus* is sometimes pale fulvous brown, and the margins always pale; in some instances even white.

Among my Ventnor *icarus* and var. *icarinus* are specimens with orange markings on the under side paler and less distinct than in any example of *hylas* I have seen. On the other hand, one specimen of *hylas* from Switzerland has the orange crescents on the under side of posterior wings quite as bright, though not quite so large, as in the Irish *icarinus*, figured, Pl. II., fig. 4. With regard to the black spots on the under side of fore wings, Swiss *hylas* has certainly a slight advantage over Irish *icarus*; but some of the examples of *hylas* from Vienna must give way both to Irish and some English *icarus* in this matter. Then the white discoidal spot on the hind wings of *hylas* cannot be considered as a character peculiar to this species, as we find the same thing in most Scotch, Irish, and a few English examples of *icarus*, to say nothing of *bellargus* and *corydon*.

Larva.—The following extracts from Dr. Lang's* descriptions of *hylas* and *icarus* will show how closely similar the larva of the former is to that of the latter, as regards the more prominent characters:—

Hylas.—Head, black; ground colour, dark green; dorsal line, darker green; lateral streaks, yellow.

Icarus.—Head, black; ground colour, green or olive; dorsal line, darker shade; lateral streaks, lightish green.

Dr. Lang says that the larva of *hylas* feeds on the flowers of *Melilotus officinalis*. Mr. Kanet also gives this plant, and adds trefoil. Looking over a list of plants upon which the larva of *icarus* has been found, or which it has been known to eat in confinement, I note that one or two species of each of the following genera of Leguminosæ are included:—*Ononis*, *Medicago*, *Trifolium*, *Lotus*, *Astragalus*, and *Ornithopus*. Thus we find that both *hylas* and *icarus* affect *Trifolium*; and I think that *icarus* would not object to *Melilotus*. On the other hand, we have no

* 'Rhopalocera Europæ.'

+ 'European Butterflies.'

proof that the larva of *hylas* does not feed on *Ononis* or *Lotus*, for instance.

Distribution.—Southern and Central Europe; Asia Minor. Mr. Kane says it is locally abundant in Swiss valleys on limestone formations.

Var. *nivescens*, Kef.—This form of *hylas* is found on limestone mountains in Catalonia and Andalusia. The upper surface colour of the male is silvery grey, with well-defined dark brown hind-marginal borders on fore wings. Hind wings with dark spots, and a narrow border on hind margins. Under side very similar to Swiss examples of the type, but the colour of the fore wings is rather paler, and the hind margins consequently do not contrast so strongly with the rest of the wing. The white streak on hind wings is stripe-like, as in *damon*, but does not show so conspicuously, because of the paler colour of the ground, and the black spots are much smaller than in the type; in one example several of these spots are entirely absent.

The Armenian form, *armena*, Staud., has the fringes somewhat broader than usual, and the spots on the under sides of inferior wings almost entirely eliminated.

Lycæna escheri, Hüb.
agestor, Godt.

“Fringes of all the wings white. The male has the wings blue, tinged with lilac, much resembling *L. icarus* in colour, but rather brighter; all the wings have a very narrow black hind-marginal border. The female is brown, slightly tinged with blue at the base; the fore wings have a black discoidal spot and an orange hind-marginal band indistinctly defined on its inner edge. The hind wings have a sharply (defined) hind-marginal band. Under side very much as in *L. icarus* var. *icarinus* (there being no basal spots); the ground colour is, however, lighter, and the black spots are very large and defined.”—Lang’s ‘*Rhopalocera Europæ*,’ p. 119.

I have only eight examples of male *escheri*, but among this small number there are specimens with a mauve tint, others shaded with violet, and one something like *bellargus* in tint, but tinged, in certain lights, with mauve. One specimen from Evolena has a blackish shade along the hind margins, and one or two others have indistinct spots on hind margins of inferior

wings. The nervures are blackish on the margins of all the wings, but most distinctly so on the posterior pair, where they project more or less into the white fringes. In females from the Simplon there is scarcely a trace of a discoidal spot, no orange markings on the fore wings, and but the slightest vestige of orange on the hind wings; whilst in other female examples from the Valais the orange bands are bright and well-defined.

In some specimens the under side coloration is similar to that of *icarus*, whilst in others it more nearly approaches that of *bellargus*. The basal ocelli are absent, and in the remaining eyed-spots of some examples the black pupils are very large, but in several others are not a whit larger than the black spots of some Irish *icarus*. The white streak is present, but sometimes, as in the other species previously noted, indistinct.

Larva unknown. An alpine species, occurring in France, Switzerland, Savoy, Piedmont, Spain, and Portugal.

(To be continued.)

ON MELANISM.

BY J. JENNER WEIR, F.L.S., F.Z.S., F.E.S.

I HAVE read and carefully studied Mr. Dobrée's very instructive paper on this subject, which appeared in the February number of the 'Entomologist,' pp. 25-28.

So far as my limited knowledge extends there is no connection between the tendency to melanic variation in Lepidoptera and the high latitude they may have been produced in, but, on the contrary, I find that, so far as the Lepidoptera of Russia in Europe are concerned, of the 300 species I have received from the neighbourhood of St. Petersburg, from the late Mr. Field and Mr. Erschoff, none show the slightest melanism. I am, not, however, disposed to think that this point "destroys Lord Walsingham's latest and ingenious theory" on this subject, as Mr. Dobrée states, but modifies it, and confines the phenomenon to the higher latitudes of the British Isles, and to high altitudes.

Lord Walsingham's theory of melanism in Lepidoptera was embodied in his address, as President of the Yorkshire Naturalists'

Union, delivered on March 3rd, 1885, and was commented upon by me in the 'Entomologist' (Entom. xviii. 81-87), to which I beg a reference.

It appears to me that Mr. Dobrée has misunderstood Lord Walsingham's theory of melanism, viz., "that a large expanse of white snow tends to produce it." Such was not my reading of the author's theory in 1885.

I have refreshed my memory and carefully re-read the address, and as I understand the theory put forth, it was, shortly, that the dark coloration of Lepidoptera from both high latitudes and altitudes was of service to them, because in such localities "they require rapidly to take advantage of transient gleams of sunshine" (*vide* page 10 of the Address).

I have myself travelled in the Netherlands, Belgium, France, Germany, Switzerland, the Tyrol, Bohemia, Spain, and Italy, and in all these countries, except in the mountains, I have been struck by the extreme clearness of the atmosphere. In Bohemia, Italy, and Spain I found this to be the case in the greatest degree; in fact in Bohemia I found to my sorrow, one very hot day, that the town I could plainly see and I thought to be but four miles distant was sixteen miles away. In the mountains of Switzerland and the Tyrol the clearness of the atmosphere was nearly as great, but constantly interrupted by dense mists and clouds, and it is precisely in these altitudes that melanism becomes rather the rule than the exception; many of the topomorphic varieties are melanic, and many of the alpine species are very dark; *Pieris rapæ* var. *bryoniæ* may be given as an example of the former, and the male of *Melitæa cynthia* of the latter. This uncertain condition of the weather is characteristic of the climate of the British Isles. The result is that our indigenous Lepidoptera are, as a rule, darker in colour than the continental, and the tendency to melanism increases northwards, till it may be said to culminate in the Shetlands.

If I am correct in my views, and I think the facts I have brought forward are in accordance with Mr. Dobrée's, then it follows that, in the British Isles and in the mountains of Europe, it is essential to the imagines of Lepidoptera that they should rapidly take advantage of transient gleams of sunshine, and this, *the darkening of their coloration*, enables them to do. I have myself seen *Vanessa urticæ* fall helpless in its flight when the sun

passed behind a cloud in spring; and in the wet summer of 1879 the rapidly flying *Argynnis paphia* was easily captured with the fingers, having taken refuge in the brambles when disturbed, because it was unable to fly. If this occurs in the South of England it would be much more likely to occur in the more northern parts of these islands and in the Alps.

In conclusion I cannot but express my admiration of Mr. Dobrée's excellent paper, which is a most valuable addition to the literature of melanism.*

ON THE SEXES OF LEPIDOPTEROUS LARVÆ.

By J. ADOLPHE WENIGER.

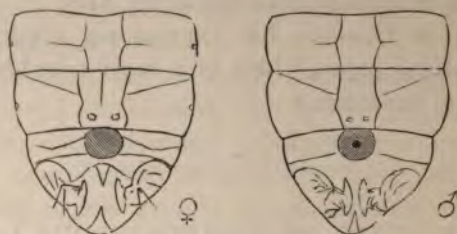
It is during my voyage from England to New Zealand that I am writing the following lines, which I trust will be of interest to entomologists.

Larvæ which produce Lepidoptera have been, up to the present time, a puzzle to entomologists with regard to the sexes. It is said that the lepidopteron while in its larval state has no sex, and that the only means by which an entomologist is able to distinguish the male from the female is by its size. This is not always the sign to go by, for it may be sometimes a large male and a small female. I therefore devoted all the time I could in 1886 to discover if other means could be found for defining the sexes of larvæ. The larvæ on which I have made my experiments were those of *Attacus yama-maï*.

It is not possible to detect the difference before the second or sometimes third change, on account of its being so small, and the larvæ being too tender or delicate to handle. The drawing which accompanies my note, and which is a perfect representation of those I had alive and full grown in April, will be sufficient to enable an entomologist to pick a male larva from the female larva. I may here state that I have known diseases in the female larva, but never in the male. On taking a larva of the above species, or even *pernyi*, *selene*, *cecropia*, &c., and gently taking off the hind part of the larva, turning up the under side, and examining the last segment that bears a spiracle, what is

* Read before the S. Lond. Entom. and Nat. Hist. Soc., February 24th, 1887.

reproduced in the drawing below will be seen by the aid of a good glass. No. 1 is the female: it will be seen that the black blotch in the middle of a yellowish tint, and which at natural size is not larger than a large pin's-head. In the drawing which is No. 2, it is the same blotch at the same place,



SEXES OF LEPIDOPTEROUS LARVÆ.

the middle is a dark green spot, which gives the appearance of a hole: this is only from the internal organs, and is of a soft substance; for should a larva of each sex be killed and examined, nothing of the signs will remain. By this means of telling the male from the female, I have no doubt advantage will be gained as in the case of the Tusser-worm, reported by Claud DuRoi (Entom. xix. 110), the female cocoons only being picked for breeding purposes: the female and male could thus be distinguished within a very short time.

[Having been asked to express an opinion upon Mr. Weniger's communication, I can affirm that the position in which the characters are stated to be is that in which such characters occur if they were proved to be present. This, in itself, is a strong argument in favour of the accuracy of Mr. Weniger's observations. Nevertheless, I do not think that the characters can be easily marked in all larvæ, for I have frequently examined the larvæ of Sphingidæ in this very area and with this very object in view. It is quite clear that, as Mr. Weniger implies, the male does not have the value of external organs of reproduction, but if their presence is confirmed they will prove to be the blind terminations of the ducts of the sexual glands, which should be found beneath the cuticle at this very spot, as Herold showed, in the case of the larva of *Pieris brassicæ*, towards the beginning of this century. It is unfortunate that so new an observation is not supported by a quotation of the numbers of individuals in which the characters were proved to correspond with the respective sexes. Y

firmed, the observation will certainly possess all the importance the author claims for it, and it is quite clear that the description is sufficiently well-founded to deserve the most thorough investigation before it can be assumed that the author has been mistaken. This being the case it is in every way advisable that the observation should be rendered public, that the opportunity for confirmation may be taken by the investigation of many species of larvæ during the coming season.—EDWARD B. POULTON.]

LEPIDOPTERA OF SOUTH BUCKINGHAMSHIRE.

BY REV. J. SEYMOUR ST. JOHN.

WHETHER this particular part of the county—on the borders of Middlesex, Herts, and Oxfordshire—has ever been worked entomologically, I know not. Mr. Stainton mentions Halton in his books, which is a good sixteen miles north of my locality (Chalfont St. Peter), as the crow flies. Being within reasonable distance of London, twenty miles from the Marble Arch, and a very likely-looking bit of country,—gravel and chalk soil, with plenty of trees of all kinds, shrubs, undergrowth, common and wood, in good profusion,—it may prove interesting to some readers to know what I have done in the past season of 1886. With not too much time on my hands for entomologising, and the daytime being all occupied, I had to leave the Diurni to themselves. Anyone who could give up his whole time could record, I feel sure, a better bag than myself.

I must content myself on this occasion to give simply the *actual captures* of Macros each month which I made, stating the number of each, except when I took only single specimens of a species, in which case the name only is given without comment.

MAY.—Caught:—*Hepialus hectus* (common), *Hemerophila abruptaria*, *Anticlea nigrofasciaria*, *Coremia unidentaria* (4), *C. ferrugata*, *Selenia bilunaria*, *Eupithecia vulgata* (6), *E. consignata*, *Cidaria suffumata*, *Ligdia adustata*, *Rumia luteolata* (2), *Melanippe fluctuata* (common), *Asthenia candidata* (common), *Numeria pulveraria*. At light:—*Plusia gamma*.

JUNE.—Caught:—*Iodis lactearia* (6), *Eupithecia rectangulata* (4), *Ligdia adustata* (3), *Asthenia candidata* (common), *A. luteata*, *Bapta tenerata*, *Melanippe montanata* (common), *M. unangulata*, *Cabera*

pusaria (2), *Vevilia macularia* (common), *Tephrosia punctularia* (7), *Thera simulata* (common), *Bupalus piniaria* (10), *Phibalapteryx tersata* (3), *Zonosoma punctaria*, *Camptogramma bilineata* (abundant), *Rusina tenebrosa*, *Plusia chrysitis*, *Euplexia lucipara*, *Habrostola tripartita* (2), *Drepana falcatoria* (2). At rest:—*Hecatera serena* (3). At light:—*Spilosoma lubricipeda*, *S. menthastri* (both common), *Noctua festiva* (7), *Mamestra brassicæ* (common), *Phalera bucephala*, *Cidaria fulvata*, *Hadena dentina* (4), *Xylophasia monoglyphæ*. At sugar:—*Acronycta psi*, *Xylophasia hepatica*, *Grammesia trigrammica*, *Agrotis exclamationis* (common), *Miana strigilis* (2), *Nola cucullatella*.

JULY.—Caught:—*Habrostola tripartita* (3), *Caradrina morpheus*, *Noctua festiva* (common), *Leucania lithargyria* (3), *L. conigera* (7), *Thyatira derasa*, *Hydrœcia nictitans* (common), *Lithosia complanula* (2), *Cidaria fulvata* (common), *C. dotata* (3), *Rumia luteolata* (common), *Acidalia imitatoria* (3), *A. holosericeata* (2), *A. virgularia* (2), *A. dimidiata* (5), *A. scutulata* (3), *A. aversata*, *A. remutata*, *A. dilutaria* (2), *Timandra amatoria*, *Metrocampa margaritaria* (2), *Hypsipetes sordidata* (common), *Hemithea strigata*, *Melanthia bicolorata* (2), *Halia vauaria* (2), *Larentia viridaria*, *Selenia bilunaria* v. *juliaria* (2). At light:—*Eupithecia rectangulata* (2), *Scotosia vetulata*, *Leucania comma*, *Rusina tenebrosa*, *Apamea didyma*, *Plusia iota*, *Pterostoma palpina*. At sugar:—*Xylophasia lithoxylea* (3), *X. hepatica* (2), *X. monoglyphæ* (common), *Hadena thalassina*, *H. oleracea*, *Agrotis exclamationis*, *A. segetum*, *Caradrina quadripunctata* (2), *Noctua augur*, *N. brunnea*, *N. baia*, *Apamea basilinea*, *A. didyma* (common), *Miana strigilis* (6), *M. literosa*, *M. fasciuncula* (6), *M. furuncula*, *Mania maura*, *M. typica* (5), *Amphipyra pyramidea*, *Leucania pallens*, *L. impura*, *Mamestra persicariæ*, *Triphæna pronuba*, *T. ianthina*, *T. interjectaria*, *Erastria fasciana*. At rest:—*Acronycta psi*.

AUGUST.—Caught:—*Coremia unidentaria*, *C. designata*, *Melanthia albicillata*, *Selenia bilunaria* v. *juliaria*, *Cidaria russata* (6), *Crocallis elinguaris*, *Acidalia trigeminata* (2), *A. aversata*, *Melanippe fluctuata* (common), *Eugonia quercinaria*, *Larentia viridaria*, *Eupithecia subfulvata*, *E. centaureata*, *Halia vauaria*, *Scodiona belgiaria*, *Drepana lacertinaria*, *Odonestis potatoria*, *Lithosia complanula* (2), *Mamestra sordida*, *Epunda lichenea*. At light:—*Hepialus sylvanus*, *Habrostola tripartita*, *Neuronia popularis*. At sugar:—*Mania maura* (4), *Calymnia trapezina* (7), *Noctua triangulum*, *N. xanthographa* (common), *N. stigmatica*, *N. c-nigrum*, *N. rhomboidea*, *N. dahlia*, *Polia chi*, *Triphæna comes* (common), *T. interjecta*, *T. pronuba* (common), *T. ianthina* (common), *Miana furuncula* (2), *Mamestra brassicæ*, *Amphipyra tragopogonis* (common), *A. pyramidea* (9), *Xanthia gilvago*, *X. citrargo* (5), *X. circellaris* (2), *X. fulvago*, *Neuronia popularis* (3), *Phlogophora meticulosa* (2), *Catocala nupta* (2).

SEPTEMBER.—At sugar:—*Hadena protea* (common), *Noctua c-nigrum* (6), *Catocala nupta* (common), *Agrotis saucia* (2), *Amphipyra pyramidea* (common), *Phlogophora meticulosa* (4), *Xanthia aurago*, *X. fulvago* (3), *X. circellaris* (common), *Gonoptera libatrix*, *Plusia gamma* (2), *Leucania pallens*, *Anchocelis lunosa* (4), *A. litura* (common), *A. pistacina* (common), *Polia flavicincta* (9), *Cerastis spadicea* (2), *Xylina semibrunnea*, *Thera simulata*, *Cidaria russata*.

OCTOBER.—At sugar:—*Xylina semibrunnea*, *Polia flavicincta* (4). At ivy:—*Orthosia macilenta* (common), *O. lota* (4), *Cerastis vaccinii* (common), *Miselia oxyacanthæ* (4).

I also took a fair number of other *Eupitheciæ* during the season besides those named, which I have not with certainty classified. Larvæ of *Abraxas grossulariata*, *Leucania lithargyria*, and *Porthesia similis* were very common. The season was decidedly a late one. So far I have no reason to be dissatisfied with the products of this neighbourhood. All I have mentioned were taken in this parish, and all those at sugar on half a dozen apple trees in my small garden. I used simply coarse treacle with a little rum, and have never been more successful.

Chalfont St. Peter, Slough, February, 1887.

NOTES ON THE NOTODONTIDÆ.

BY THE REV. BERNARD SMITH.

WITHOUT difficulty there is no interest; and that is why, perhaps, I like the Notodontidæ; for it is a drawer in one's cabinet not easy to fill. Last year we turned up in this district *Notodonta trimacula* (*dodonea*), *N. trepida*, *N. dictæoides*, and some others, which of late had disappeared.

I wish to advocate looking for the ova of this class, not excluding, of course, the young larvæ. Without this course we should hardly find the maple Prominents, *Ptilophora plumigera* and *Lophopteryx cuculla*; at least this was the way I found them; and, as I feel dissatisfied at so few being found elsewhere, I propose to furnish some particulars which may lead to their discovery. First, about *P. plumigera*, as I believe myself to have turned up this insect here about 1854, after it had not been taken in England for some fifty years, I have pleasure in recording

a few of the habits of this little Prominent. The eggs are laid in November on the slender twigs of the common maple, mostly singly, or two or three together, often near a bud. They may be found chiefly in hedges, that are open and not shaded by trees, by looking when the sun shines; and where one is found, others may be expected near. Most are found in March, owing to the weather being brighter then, and some early in April, if the buds are not too much swollen. The eggs do not hatch in nature till early in May. In confinement the eggs must be kept in a very cool place, and will even then hatch about April 17th to 25th, in most cases. The egg is a light umber-brown, with a white base; it looks glazed through a lens. Some are lighter in colour, and still are fertile. If you have not maple or sycamore trained against a south wall, young seedling sycamores may be found at the bottom of hedges in early leaf. The larva will feed well on sycamore and Norway maple, as well as *Acer campestre*. The young larva is very helpless, and often fails to find its food.

The larvæ may be found about the end of May on the sunny side of maples, but less easily than the eggs. They are full-fed early in June, and bury often two inches deep in sandy mould pressed rather firmly. The pupa, which hangs in its cocoon like a clapper in a bell, should not be disturbed. The larva is quiet and gentle, like the perfect insect, and has nothing cannibal in its nature. Others have praised the genus *Eupithecia* as pleasant to rear, but give me *Ptilophora plumigera*. I have taken the eggs in Buckinghamshire, Berkshire, and Oxfordshire on the chalk; and have known the moth taken in Hampshire, and at Great Malvern in Gloucestershire.

The time of the insect's appearance is mid-November, in mild foggy weather. The circumstance which first led me to search for the eggs was that about thirty specimens of the moth were brought me from the lamps, by the man who extinguished them about midnight, one November. These were males; but one female, taken on a foggy night, enabled me to identify the eggs when found afterwards on a twig of maple.

Plumigera comes out usually in a burst, males and females together, which makes it more easy to secure fertile ova. They pair usually about 7 p.m., and for about an hour. One female can lay about 150 ova, but in confinement half this number is above the average. I have found ova more than twice the usual

size, but rarely. This fact suggests that the species varies in size, as it does in tint.

Three varieties of the male imago are known to me. These I shall call—*flavescens*, the lightest; *nigricans*, the darkest; and *unicolor*, having the fore wing uniform in tint, as in the female. The shade of the female is also very various. One variety is a light chestnut, reminding one of a Highland *castanea* (*neglecta*) var. *lævis*.

The moth usually emerges about noon, and the wings are hardly dry by the evening. It is better to keep them twenty-four hours. The males should be killed quickly, to preserve the antennæ in good form. I use bruised laurels and chloroform for this purpose. They may be left in this for twenty-four hours.

Marlow, Bucks, March 7, 1887.

ON COLLECTIONS OF LEPIDOPTERA.

By F. H. PERRY COSTE.

SOME time ago the Editor of the 'Entomologist,' in reviewing Mr. C. Roberts's 'Naturalist's Diary,' indicated that the province of the collector may be exhausted in a few years; that of the observer, never. Mr. Roberts, in the book in question, remarks, in substance, that the methods of naturalists have of late years undergone a change, and collections are less regarded than they were by the older naturalists.

These remarks may serve to introduce a subject which has somewhat attracted my attention lately, causing me, for my own satisfaction and information, to seek the advice of several well-known entomologists and collectors. These gentlemen, to all of whom I was utterly unknown, answered my enquiries in the kindest manner, and I intend presently to quote one or two passages from their letters, in order to illustrate my subject the better. Lest I be misunderstood, and thought to write dogmatically, let me say at once that I have written this article in the hope of raising in these pages a discussion, and of eliciting the opinions of various readers of the 'Entomologist.' I cannot doubt that such ventilation of the question would be as interesting and serviceable to others as to myself.

What is the logical *raison d'être* of a collection of Lepidoptera? of what educational value is such a collection? and, looked at from an educational and scientific standpoint, is the game worth the candle? Most men being engaged during the greater part of the day in business, the amount of time at their disposal is limited; whilst what time is available for scientific culture is necessarily still more limited. Looking at the subject from this point of view, it occurs to me that the time devoted to making a mere collection of Lepidoptera is very inadequately remunerated by scientific knowledge. Like so many others I commenced collecting as a boy, and at first for the mere sake of collecting. Gradually I evolved an interest in Entomology itself, while as I grew older, and became more sensible of the value of time, and also came to have less leisure, I began to seek in my own mind for the justification of collecting, and to enquire how to study a collection or how to use it as a *means* to knowledge. Of course everyone must admit that some collections are necessary: we should have perfect collections in museums for reference, for purposes of classification, and for the information of naturalists generally. Again, in the early days of Entomology no doubt collections greatly contributed to the advance of a knowledge of the science; and if we desire to study the entomology of some newly-discovered country, a typical collection of its insects would be eminently necessary and useful.

My argument is this:—Now that English Lepidoptera are so well known and described, and typical collections located in various museums, might not the many hundreds of amateur entomologists derive far more pleasure, information, and scientific knowledge from the study of Lepidoptera otherwise pursued than they do from making collections as at present? It is obvious that these considerations are inapplicable to those who look on their collections as the end of the entomologist. Somebody has somewhere well described man as a "collecting animal": those who look upon collecting simply from the collector's standpoint may be left to the enjoyment of their delightful—and of course to a great degree instructive—recreation. I am addressing myself to those who look upon a collection simply as a means to scientific knowledge; and my question is—Are these means to an adequate degree productive of the required end? I am not at the moment denying that much may be learned from a

collection: the colouring, markings, variations, classification, &c., may be studied; but then individual collections are not indispensable for these purposes, which would be served by visits to a museum, and to a lesser degree by examining coloured drawings. Even should we admit the usefulness of private collections for these purposes,—considering the large amount of time that is spent in the catching, setting, and exchanging insects,—would it not be better and more truly economical to buy a typical outline collection? One of my correspondents, in an exceedingly kind letter, well put the matter thus:—"With regard to the educational value of a collection of Lepidoptera, I don't think it is worth the time that we spend on it. If there were no setting, but only the collecting and arrangement, it might be; but the time spent on setting is, to my mind, wasted educationally. To men of little leisure, and who do not treat the matter as a recreation and a change from their ordinary labour, I don't think the game is worth the candle."

Such, I may say, is a view that—I own against my will—has to a great extent forced itself on my mind. I should add, however, that another correspondent, well known in the entomological world, wrote:—"A museum, I think, does not teach a man so much as his own private collection. The attention claimed by setting the insects must make one see things more definitely."

Lest I be blamed for my suggestion that a collection might be bought, and be told that I am slighting field-work, let me say that field-work, which is carried on simultaneously with our constitutional walks, and adds so greatly to the charms of a country ramble, is in no way the loss of time setting is. Again, with less collecting and setting the entomologist would have more time available for breeding the various species; and, thinking less of his cabinet and more of Entomology, would feel disposed to take Dr. Knaggs' advice when he says that insects caught, instead of being at once killed and set for the cabinet, should rather be kept alive and allowed to breed, thereby affording us the means of studying the whole life-history of the species.

I should still advocate the collecting of insects by boys: their time is less valuable, they find it a delightful amusement, and learn to know all our commoner insects, their haunts, and their classification; whilst, as they grow older, they slide gradually from

collecting into scientific entomology. Herbert Spencer says:—The practice of breeding larvæ, “when joined with the entomological collection, adds immense interest to Saturday afternoon rambles, and forms an admirable introduction to the study of physiology.”

15, Bruce Grove, Tottenham, February 11, 1887.

COLLECTING BRITISH CLEAR-WINGED LEPIDOPTERA.

By JOHN T. CARRINGTON, F.L.S.

ALTHOUGH much of what I am about to write may not be novel to some of my readers, there may be somewhat therein which will arouse more than a passing interest in this group of beautiful and interesting moths.

Those who have not yet turned their attention to the study of our “clear-wings” need not fear the difficulty which reputedly surrounds the collecting of these insects, as one or other of them may be found in almost every neighbourhood throughout our islands. If we go through half a dozen average collections of British Lepidoptera we are pretty sure to find the Sesiidæ sparsely represented, and as often as not passed over with some remark about being “hard to get.” It is with the object of lessening this difficulty and increasing an interest in the group that I venture to pen this article. We may first premise that—in the ordinary sense—there are no rare moths; that is to say, we have only to know something of the life-histories and habitats of our rarities to be able to obtain our series, and, may be, further knowledge in their collection.

All the clear-wings are lovers of bright warm sunlight, and it is only in sunny places where we may expect to find them in any stage of their metamorphosis. This habit must be remembered when rearing them, for it is necessary to keep the pupæ in such situation that the moths may have the advantage of the warm early-morning sunshine to bring them out of the pupæ. The opposite effect of the sunshine must, however, be avoided by occasional damping of the cage, otherwise they would dry up before turning to imagines, drought and darkness being alike *fatal to most* of them; neither must the moths be left in the cage

long after emergence, or they will become sadly injured by a wild flight so long as the sun rests on their prison.

In a state of nature the clear-wings emerge early in the morning. No sooner have the night dews disappeared and "the world become aired," on a bright sunny day in May or June, than out come these gems of nature and rapidly dry their wings. This drying process is, in some species, executed with surprising haste; indeed little more than a shake or two, if there be a slight breeze in the air, seems sufficient to unfurl wings that are ready for flight. So the collector of Sesiidæ, if he would get fine fresh specimens, must be up and about in the early morning; when he will get—if no clear-wings—health and enjoyment of Nature in her freshest mood.

There is still much to be learned from the study of the life-history of the Sesiidæ; for example, how many lepidopterologists are there who know that, like some of the large Bombyces, the virgin females have the happy power of causing the assembling of numbers of males, which easily become prey to the dexterous lepidopterist? I am so informed by my friend Mr. Tugwell, who has by this means obtained males of at least one of the genus *Sesia*; therefore we may expect females of other species of the family to possess the same attractive faculty. This means of working for clear-wings is well worth trial, and the results will be interesting when recorded.

As two moths of the genus *Macroglossa*, in this country, have clear wings as well as the Sesiidæ, it is only fair to mention them, and, as in the arrangement of our Lepidoptera they come first, we will take them before those which possess larvæ so different in character. Both these moths occur in May,—*M. fuciformis* being chiefly southern in its distribution, while *M. bombyliiformis* is more northern and western. They appear to cross each other in places, for in some localities both occur, though one or other more frequently than the other as we go farther north or south.

Macroglossa fuciformis is by no means uncommon in some open woods in Kent, Sussex and Surrey. The moths are particularly fond of hovering over patches of common bugle (*Ajuga reptans*), darting their flexible tongues into the purple flowers. They are not easy to take, for the flight is rapid and the moths very timid. Another attraction are the great trusses of

handsome flowers of the rhododendrons, now so commonly planted in some woodlands as a winter cover for game, which find shelter under the evergreen leaves. It is a beautiful sight to see a couple of these active insects hovering around a bunch of the pink flowers on a bright May morning.

The larvæ of this and the next species are Sphinx-like, having a little "tail-" or "horn-like" process on the anal segment. The food plant, honeysuckle, occurs almost everywhere, but the trailing sprays in sunny woodlands are the favourite feeding-places. About the middle of July and on into August, gently turn the sprays over and examine the under side of the leaves, and if present the larvæ will soon be detected. Newman, in 'British Moths,' mentions several other plants as food, such as *Knautia arvensis*, *Galium verum*, *Lychnis*, &c. I cannot confirm any of these as natural foods of this species—honeysuckle being the shrub generally affected in this country; and they appear to feed readily on any cultivated variety of *Lonicera*. The colour is lively green, with dark yellow subdorsal line. The horn is brownish at the tip.

Macroglossa bombylifformis occurs in open meadows near woods, heathy tracts by the sides of woods, and very open glades by woodlands. It used to appear in our text-books as the commoner of the two species; this was either a mistake or times and conditions have changed with this moth, for it is not so now. On one occasion only did I ever see this moth in anything like numbers, and that was under special circumstances. While driving from Roundwood to the Seven Churches, by Glendalough, County Wicklow, in Ireland, with my friend Mr. A. G. More, we stopped as we crossed the bridge which spans the little trout stream connecting Loughs Dan and Luggala,—he to play with artificial flies and brown trout; I, with my net, among the natural flies. The day was very cloudy and heavy, but hot. Much to my astonishment, on entering the meadows by the river side, I found a specimen of *M. bombylifformis* slowly hovering over a plant of red rattle (*Pedicularis palustris*) which was with the insect duly netted; for experience had taught me in Yorkshire, that striking sideways was useless in capturing this fast-flying moth. Always strike down while it hovers over the flower, and then lift the bottom of the net and it will flutter upwards. Further search, during the hour or so we

had at our disposal, secured some twenty or thirty specimens in lovely condition. Lousewort flowers (*P. sylvatica*) are much frequented by these moths. Ireland seems to be more favoured than Great Britain by this moth, for I note (*Entom.* v. 81) the late Mr. Edwin Birchall records its capture somewhat abundantly in Connemara in 1869, by the Hon. Emily Lawless, who found fresh specimens in May, worn ones in June, and other fresh specimens in July. There seems, in this instance, to have been a retarded development for some reason. Inverurie, in Scotland, has also been given as a locality (*Entom.* v. 349). Nearer London, Newbury, in Berkshire, has been mentioned (*Entom.* xvi. 209) by Mr. Sladen, who took a dozen in May, 1883, at flowers of lousewort (*Pedicularis sylvatica*).

The larva has been found upon the under sides of devil's-bit scabious (*Scabiosa succisa*), and, like its neighbour last mentioned, it also has a tail or horn on the anal segment. The general colour of the larva is dark green, with large spiracular pinkish spots or dashes. It feeds in July, and is well worthy of search. I should think that if a plant of scabious were placed in a large flowerpot, covered by a large-sized bell-glass, in the morning sun, the females of *M. bombyliiformis* might be induced to deposit ova, which if reared into imagines would be of great interest, for it is said that before the wings are dry they are thickly coated by scales, which shake off at the time of the first flight. This seems a very suggestive process in the natural history of these fast-flying moths.

Trochilium apiformis.—This moth is more southern in distribution than the following species, and appears in June and July in wooded districts. They are best found by searching for the newly-emerged imagines. The instructions given for taking those of *T. craboniformis* may be followed, though of the two species this one is less active than the next.

The larvæ feed in the solid wood of poplar and aspen for two years. The mines are generally just above the ground and below it into the roots. Woodcutters in spring expose larvæ of all ages, which can otherwise be traced by the sawdust-like frass thrown from the holes bored by the grubs. A curious instance of these larvæ adapting themselves to their surrounding circumstances is mentioned (*Entom.* vi. 79), where some ova, deposited by a female in June upon the setting-board on which it was left

to dry, hatched, and in the following January were discovered apparently healthily feeding on the cork setting-board, which was riddled by the little caterpillars. The larvæ generally pupate near the exit of their gallery, but sometimes come out and go beneath the earth outside, about the end of May. As the moth emerges, the pupæ push themselves partly out of the cocoon.

Trochilium craboniformis (*bembeciformis*).—The moths of this species usually emerge in June or early in July, quite early in the morning, soon after the sun has gained some power. The males take a very short time to dry sufficiently for flight, but may be found drying their wings immediately over the empty pupa-cases, which are to be seen sticking out of the end of the hole bored by the larva in the solid wood of the trees on which they feed. Females are not quite so active, and may be found as late as seven or eight o'clock in the morning; often in copulâ with a male before the wings of either are quite dry enough to take flight. Willows and osiers are said to be the standard food of the larvæ of *T. craboniformis*; but as it happens, I have only taken imagines on young Lombardy poplars. Several such trees near Birkenhead produced a fine series in three or four mornings' work. Mr. Gregson, of Liverpool (Entom. xiii. 137), in an interesting article on this moth, says that in South Lancashire and Cheshire the growers of black poplars (*Populus nigra*) sustain great loss from the ravages of the larvæ of this species, which feed for two seasons in the larval state, three or four generations usually killing the trees in the course of six or eight years. Osier beds in the same district also suffer to a considerable extent. It has been said (Entom. v. 380) that by following woodcutters in spring, cut stems of sallow containing these larvæ may be found in sufficient numbers to repay for the time and gratuity necessary to secure them. This I have seen myself, though I have never tried to secure the larva, which in one instance was common and apparently destructive. On March 23rd, 1883, Mr. W. Tristram says (Entom. xvii. 19): "Having heard that labourers were cutting an osier bed belonging to the Leicester Corporation, I obtained the kind permission of the town surveyor, and with the assistance of a friend and my saw I obtained upward of 150 sticks, with nearly full-fed larvæ of *bembeciformis* in them. Not having room for all, I sent the greater number to friends. The results of those I retained

were as follows: out of twenty-four pupæ carefully taken on May 14th from the sticks, I only obtained nine imagines; out of these two were crippled, and the others were not of bright colour. Out of twenty-four sticks placed in a cage with holes downwards, and covered in two inches of sand, I obtained twenty-three perfect specimens and but one cripple. These emerged during June from 6th to 16th. . . . I may say that in no instance did the larvæ reach more than ten inches in the sticks from the root." It is also said that this larva frequently feeds in stems of willow and sallow, so thin that it could not be believed to inhabit so small a space.

Sciopteron tabaniformis (= *asiliformis* = *vespiforme*). — This moth has occurred so rarely in this country that it can hardly be considered a British species. It is said to occur in June, and the larvæ feed upon the roots of aspen and poplars.

Sesia scoliiformis. — To obtain the specimens of this moth as they emerge from pupæ, means rising by dawn of day, and watching closely the trees known to be affected by this species. I have in two localities seen such trees, which were in each case large, old, rough-barked birches. The one was in the wood, on the right of the river, about a mile or so west of Llangollen. They were the same trees that were worked by Ashworth, Greening, Gregson, and Cooke. It was the latter who showed me the spot; but although we worked hard on several mornings, we saw no trace of the moths nearer than one or two pupa-cases protruding from the little holes in the bark from which they had emerged. The other locality was at the very top of the Black-wood of Rannoch, where there are many such trees affected. There, too, I saw in another season empty pupa-cases, but failed to get the moths. They have a curious habit, Mr. Cooke told me, of jumping backwards before taking flight when disturbed, which habit Mr. Birchall told me also obtained with *S. musciformis*. Many were the means tried to secure these "skittish" moths by the old set of Lancashire entomologists, such as tacking leno-netting round the trees; but little was the result. Of course we have all read the poem upon the wicked (!) collectors who were supposed to have cut down the trees, and carted them all the way—a long way too—home, so as to breed the moths. I saw some of those trees in the garden of one of the vigorous collectors, but he assured me that the trees were cut

down before they were purchased. He, at least, was not a man to kill geese for golden eggs.

Full-fed larvæ have been cut out of the bark at Llangollen in the middle of May, and the moths usually appear on sunny mornings in June. There is reason to believe that the larvæ feed for two years. Either some one knows "how to take" *scoliiformis*, or else they are "commoner on the Continent," for I have seen quite a nice series—for sale—within recent times. Continental clear-wings differ little from their British relations.

Sesia sphegiformis.—I have seen traces of this moth in Sussex, Staffordshire, Yorkshire, Wales, and Ireland, so that it is doubtless more generally distributed than is supposed. The moths appear in June, and frequent the neighbourhood of alders in woods.

The larvæ feed in the solid wood of the stems of young alder trees and the boles of older trees. To find the larvæ or pupæ of this species it is best to work young trees of alder that will readily bend over, when, if present, the bark will crack over the orifice of the mine, disclosing the larvæ inside. Arranging for their collection by woodcutters in spring was successful in Yorkshire one season, and the sticks found to be bored were placed in a damp box in a sunny situation. A few moths came out, and appeared in due course on the white muslin covering.

Sesia andreniformis (*allantiformis*).—These moths are counted amongst the rarer of British Lepidoptera, though I believe, if properly looked for, they will be more frequently found than hitherto. They occur in July, and have been taken chiefly in Kent, but there are notices of their being taken in Hertfordshire and Gloucestershire. On the Continent the moths are found feeding upon flowers of privet, in some places commonly. I saw, but failed to capture, a fine specimen which was crawling over a truss of privet bloom near Gravesend, a couple of years ago; and I am persuaded that if those flowers were worked for this moth, on bright sunny days, the results would be satisfactory, in localities where the food of the larvæ grows.

I am not aware that the larvæ have been taken in this country; they are said to feed upon dogwood (*Cornus sanguinea*).

Sesia tipuliformis.—This species may be studied by the collector in the most suburban of localities. One need only go

into one's kitchen garden, where the currant trees grow, to conduct the observations. The moths may be seen sunning themselves on the bright leaves of the bushes, or flitting over them on a sunny June morning.

The larvæ feed in the stems of the shoots, probably for two years. Mr. Newstead, writing (Entom. xix. 90), says the larva should be looked for in March and April. "Select black, red and white currant bushes, that are pruned every year. Take shoots that were cut in January and February of the previous year, carefully split them open, and the larvæ will be found in the winter cocoon, not far from the end of the shoots." When the larvæ are full fed they gnaw the wood at right angles, and pupate close to the exit. This is usually just above the joint of a small twig, or where a leaf joins the twig. They leave only the finest paper-like film of the outer bark, through which the pupa pushes just before the moth emerges. These moths are not difficult to rear, if the larvæ or pupæ are taken in May. The twigs must be kept standing in moist sand in a sunny place.

Sesia asiliformis (*cynipiformis*).—This moth appears in June or early in July. It frequents localities where oak trees grow, and in some seasons is by no means uncommon in Hyde Park, London. The best way to rear this species is to proceed to an oak wood where the trees have been cut down some two or three years. Indications of the larvæ will be found by looking for the frass thrown up where the bark joins the wood on the top of the cut stumps. It is most common in the South of England.

The larvæ feed in the bark of oak for two years. The female moths prefer the cut trees, depositing the ova on the top of the cut section of bark. The simplest way is to cut off, with a saw, about four inches deep of the top of the stump containing the larvæ or pupæ, and keep these slices in a sunny, moist breeding-cage. The pupæ are then easily reared to imagines. The best time to cut off these slices is about the middle to end of May. Sometimes a single stump will produce quite a long series of the moths a fortnight later.

Sesia myopiformis.—This is another "domestic" species, to be found in the bark of apple and pear trees, as it emerges in June and July.

The larvæ feed in the bark for two years. Try to entrap them by tacking some leno-muslin over trees known to be affected, but

take care there are no small holes left for the imagines to creep out.

Sesia culiciformis.—This handsome species is out on the wing in May and June in birch woods. I have taken it in Perthshire, in Wales, in Yorkshire, and at intervals all over the South of England. The instructions for collecting *Sesia asiliformis*, given above, apply also to this species, excepting that the tops of birch stumps are to be taken instead of oak, and a fortnight or more earlier. It is common in Tilgate Forest, Sussex, and many other localities nearer London.

Sesia formiciformis.—The moths fly in the neighbourhood of osier beds in July. I have seen this species in Yorkshire, Derbyshire, and more commonly in the Thames Valley.

The larvæ feed in the inner stems of osiers, and pupate therein early in July. Saw off the tops of osier stumps about that period, and breed the moths in the same way as *S. culiciformis*.

Sesia ichneumoniformis.—To find this species, hunt about the middle to end of July on sunny days over warm banks where *Lotus corniculatus* grows, especially by the sea-side. I have found it near Southend, Essex, and all along the south coast.

The larvæ feed in the leading roots of the food-plant, and are readily traced by the light brown frass being seen at the crown of the root. The best way is to look for sickly plants, as the first indication. Carefully avoid the infested roots becoming too dry in the breeding-cage, and allow free access of morning sunshine.

Sesia musciformis (*philanthiformis*).—This moth seems generally distributed around our south-western and western coasts. I have found traces of it in Devonshire, Cornwall, near Aberystwith and in Carnarvonshire in Wales, Isle of Man, and Ireland. The moths fly at the end of June over sea-cliffs, where the common thrift or sea-pink grows.

The larvæ feed in the roots and crowns of the sea-pink, and are easily found, as they slightly discolour the plants. I have noticed that the little stunted plants growing in exposed positions are most affected. The moths are easily reared, if the plants containing the pupæ are treated to morning sunshine while in the breeding-cages.

Sesia chrysidiformis.—I have not had an opportunity of collecting this species in any stage, so I cannot do better than

quote Mr. J. Russell, who gave an interesting account of taking the larvæ of this species in 1871 (Entom. vi. 170). He says that on April 1st he took a good supply of full-fed larvæ in the now partly-lost Warren at Folkestone. Mr. Russell says:—"Proceeding along the slopes of the surface of the cliffs, I select those plants of dock or sorrel which have a sickly appearance or stunted growth; I then dig up the roots and gently remove the surrounding mould, being very careful not to damage the larvæ, whose presence is easily discovered by the mines and frass. If the root selected does not contain any larvæ I replant it, in anticipation of a future visit. Before leaving the spot I collect a small portion of chalky soil for future use. On arriving home I transfer the roots containing the larvæ to the breeding-cage. This latter greatly resembles a fern-case: it has glass sides and ends, and the top is covered with a sheet of perforated zinc; the bottom is loosely filled with a mixture of silver-sand and the calcareous soil of the Warren. In this the roots are planted, watered from time to time, and freely exposed to the rays of the sun. . . . At the end of May or beginning of June the imagos appear, leaving the pupa-cases projecting from the top of the tubes sent up by the larvæ. I have not obtained any more moths in the second season from the same plants." This species should be looked for on sea-cliffs all along the south coast. There are not many localities mentioned for it, but that is no reason why others should not be found, if similar localities to those known as its habitat, upon the Kentish coast.

As the season for obtaining all these moths is at hand, I trust these remarks may lead to the record in the 'Entomologist' of many notes and captures of British clear-wings.

Savage Club, London, W.C., March 7, 1887.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

RETARDED EMERGENCE OF *PAPILIO MACHAON*.—Seeing the note by Mr. Chitty on retardation in *Euchloë cardamines*, and as such an occurrence is supposed to be rare among butterflies, I am reminded of a case of retarded emergence of *Papilio machaon*. On August 19th, 1884, being on Wicken Fen for a

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Y

short time, I collected three larvæ of this insect. Two of these produced imagos in 1885. The third pupa, which I had supposed to be dead, produced an imago—unfortunately crippled—on June 12th, 1886.—J. H. A. JENNER; 4, East Street, Lewes, March 4, 1887.

RETARDED EMERGENCE OF *EUCHLOE* *CARDAMINES*.—Since my last note to you on this subject, I have chanced upon the following lines in the 'Addenda et Corrigenda' of Stephens' *Haustellata*, vol. i. (1828), which perhaps will prove of interest to some of your readers:—"Of six pupæ of this species (*E. cardamines*) . . . two came to perfection at the end of May, one in the beginning and one at the end of June, the other towards the middle of July, thus accounting for the long continuance of the insect in the final state." So the "much damaged specimen," taken by Mr. Field last August (*Entom.* xix. 247), may possibly have been a late member of the usual spring brood. A second or autumn brood does, however, very rarely occur, as Mr. Haylock points out (*Entom.* 63). Another notice of such an occurrence I have found to-day in the 'Entomologist' for Oct. 1865 (vol. ii. p. 293), where Edward Newman puts it down to "the exceptional weather," which was, I presume, the cause of the re-appearance of *E. cardamines*, as it certainly was of the second bloom of the horse chestnut and many fruit trees in the South of England last autumn.—H. CHITTY; 33, Queen's Gate Gardens, S.W., March 6, 1887.

ANOSIA PLEXIPPUS, L. (*Danais archippus*, F.) IN PORTUGAL.—In a letter just received from Mr. George D. Tait, of Oporto, the writer records the capture, on September 29th last, of a female specimen of this species in his garden at Oporto. Although upwards of a dozen specimens of this butterfly are reported as having been caught in South Wales, Cornwall, Devonshire, Dorsetshire, Hampshire, the Isle of Wight, Sussex, and Kent, I am only aware of the record of the capture of two other specimens on the continent of Europe, viz., one in La Vendée, in September, 1877, by Mons. Grassal; and the other at Gibraltar, in October, 1886, by Commander Cochrane, R.N.—H. GOSS; Berrylands, Surbiton Hill, March 12, 1887.

LYCÆNA ICARUS HERMAPHRODITE (?)—Having noticed that you seem to question my statement (*Entom.* 40) concerning the

capture of a hermaphrodite, *Lycæna icarus* I enclose a drawing of the insect. Among those who have seen it, I may mention Mr. J. A. Clark, Mr. T. Eedle, and a gentleman at South Kensington Natural History Museum, whom I believe to be Mr. W. F. Kirby.—M. CAMERON; 102, Clarence Road, Clapton, E.

[The description of Mr. Cameron's specimen of *Lycæna icarus* suggested rather a partial reversion to an ancestral form of the male than an example of hermaphroditism, and for this reason a query was appended after the word "hermaphrodite." However, if Mr. Kirby has seen the insect, he has no doubt pronounced it to be a hermaphrodite only after careful examination of the proper organs. At the same time I may remark that the coloured drawing sent by Mr. Cameron represents a male *L. icarus*, that is as regards the structure of wings. As sexual characters, the coloration and markings of an insect are of secondary importance only. A male may consequently possess some of the colour and ornamentation peculiar to the female, or, as is more frequently the case, especially in the genus *Lycæna*, a female may assume the colour of the male, without any concomitant change in the primary sexual character, or organs of reproduction being effected.—R. S.]

HESPERIA ACTÆON, &c., IN SOUTH DEVON.—In August, I took about thirty beautiful specimens of *Leucophasia sinapis*, flying from the foot to half the height of the cliffs. They were very numerous; I only caught those which would insist on my doing so: with them were a few *Hesperia actæon*. Only one *Colias edusa*, and one *Vanessa cardui* were noticed. *Epinephele tithonus* was very abundant, and I took a pale, almost white, aberration of this butterfly. These were all taken casually, as I was only on the look out for Hymenoptera.—R. C. L. PERKINS, Sopworth Rectory, Chippenham, Feb. 28.

NOTES ON NEW ZEALAND LEPIDOPTERA.—During the last summer a new butterfly has appeared in New Zealand, viz., *Vanessa (Junonia) vellida*. On December 26th I captured four specimens of this insect on the beach near Porirua, about thirteen miles from Wellington, up the west coast; and on revisiting the same locality on the 27th I captured another. All these were very much worn, and were restricted to a spot

on the beach only a few yards in extent. Last week, while collecting at Wainuiomata, about ten miles inland, on the east coast, I again met with the stranger, taking this time two fresh specimens, which points strongly to the fact that the insect is a veritable native. I was also much astonished to capture a specimen of the well-known *Deiopeia pulchella*, flying wildly in the hot sunshine round some bushes in the same locality. The Australasian form of *Vanessa cardui* was also more abundant than I have seen it since my arrival in New Zealand in 1881.—G. V. HUDSON; Ghwynee Street, Wellington, New Zealand, Feb. 8th, 1887.

DEILEPHILA EUPHORBIE IN CHESHIRE.—From information which I have lately obtained I have a doubt about the specimen of *D. euphorbiæ* recorded from Cheshire (Entom. xix. 250), being British; consequently I have taken it out of my collection, and intend to destroy it. I am sorry it was recorded in the 'Entomologist.'—JOSEPH CHAPPELL; 29, Welbeck Street, Chorlton-on-Medlock, Manchester, Feb. 11, 1887.

SESIA ANDRENIFORMIS IN GLOUCESTERSHIRE.—I took a single male of a "clearwing," which seems referable to *Sesia andreniformis*, at Wotton-under-Edge, at the end of last June. Being in quest of Aculeate Hymenoptera, and mistaking it at first for a species of *Odynerus*, it was speedily captured. It was flying up and down some bushes of dog-wood. Unfortunately it is not in very good condition, the anal tuft being considerably rubbed off, due, no doubt, to my not having a suitable receptacle for Lepidoptera with me.—R. C. L. PERKINS; Sopworth Rectory, Chippenham, Feb. 28, 1887.

ZEUZERA PYRINA FEEDING IN BIRCH-WOOD.—I took the larva of *Zeuzera pyrina* (*æsculi*) in a very small birch tree on March 8th, in our garden in London. It was killed in getting it out. The tree was nearly destroyed by this one grub. It had eaten the pith out from top to nearly the bottom. Could any one tell me if they have been found in birch before, and if they are rare in and near London?—R. DINGWALL; Knolly's Croft, Leigham Court Road, Streatham, March 9, 1887.

ACRONYCTA ALNI IN HAMPSHIRE.—I was lucky enough to find 11th of last year, at Brockenhurst, a specimen of this

beautiful moth, just drying its wings on the trunk of a thorn tree.—G. M. A. HEWETT; The College, Winchester, Feb., 1887.

REARING VARIETIES OF *ARCTIA CAIA*.—The following notes are upon the effects of indoor confinement on the life-history of *Arctia caia*. Having obtained a brood of ova, in July last, they duly hatched, and some rapidly fed up and changed to pupa, from which I bred about thirty imagines, most of them a trifle darker than the ordinary type. I have still a few pupæ left (five), and have now, on Christmas Day, bred two extra dark varieties, remarkable also for having very pale under wings, instead of the usual crimson, and the black spots taking up most of the wings. From the moths I bred in September and October I obtained a goodly number of ova, that will keep no doubt until next spring; while I still have alive larvæ of the first batch in two or three stages of growth, and a brood of eighty odd larvæ from moths bred from the same batch,—so have larvæ, pupæ, and imagines from the summer brood of ova, and ova and larvæ again from them. I mean to try and restock some few localities near town with some common things that have almost, and in some cases become quite, extinct, through over-collecting by variety breeders on the one hand, and also through the birds, which are becoming far too common. Many insects stand no chance against the large number of sparrows, starlings, robins, &c., that swarm in our parks and round the suburbs of London.—H. SHARP; 23, Union Street, Portland Place, London, W.

BOMBYX QUERCUS OR CALLUNÆ.—Many years ago I wrote to my old and valued friend, the late Henry Doubleday, to ask him to explain to me the difference between *Bombyx quercus* and *B. callunæ*. In reply he sent me a pair of typical *B. quercus*, desiring me to observe that in northern specimens (*callunæ*) the white spot on the upper wings of the male moth are seen on the under as well as the upper surface; also that the bands differ. "In *quercus*, on the upper wings the band turns inwards, and forms on the under wings nearly a semicircle. In *callunæ*, on the lower margin of the upper wings the band turns outward, and on the under wings turns downward to the anal angle." Mr. Doubleday also mentioned that the form figured as *B. quercus* in Newman's 'Moths' was the typical form of *B. callunæ*. He believed *B. quercus* and *B. callunæ* to be dis-

fect species. I have reared a good many *calluna*, which were invariably found in this district feeding singly upon heather in spring time; they grew to a large size before they formed cocoons, and usually emerged early in the following year, but I have known them remain for two years in these cocoons. Some of the male moths have a brilliant orange spot upon each upper wing near the thorax, which adds much to the beauty of the specimens. — FRANCIS J. BARRINGTON; Cronlyn, Rathowen, Westmeath, Ireland, February, 1887.

AGROTIS SPINOSA.—Why do the beautiful forelegs of this moth refuse to be elevated on to the sitting board, owing to the apparent tying of the tibia and tarsus together? I found this to be the case, not only in bred specimens, but in others which I took at my last year. Is it peculiar to the moth, or am I unfortunate in my specimens? It seems to be only after death that the stiffening takes place.—G. M. A. HEWITT; The College, Winchester, Feb., 1887.

PHYGALLA PEDARIA IN NOVEMBER.—A correspondent (Entom. 41), records the appearance of this insect on November 30th. I can relate also the capture of a specimen in the same month, having taken one on November 27th, 1881. In the following year it occurred abundantly throughout the spring to the beginning of May, a single specimen having been seen by a friend as late as the middle of June. In the midlands *P. pedaria* appears on the average from the middle of February to the middle of April.—W. HARCOURT BATH, Birmingham, Feb., 1887.

LAURENTIA MULTISTRIGARIA.—On February 4th I took a single specimen of *Larentia multistrigaria*. Is not this an early appearance? I find that last season one appeared on February 14th, but after this cold north-east winds set in, which apparently checked their energies, for I did not observe them in any numbers until the third week in March.—T. B. JEFFERYS; Clevedon, Feb. 10th, 1887.

ARGYROLEPIA BADIANA.—In reply to Mr. Sheldon, I beg to say there are two species of larvæ, viz., *A. badiana* and *Parasia lappella*, feeding in September in the seed-heads of burdock (*Arctium lappa*), both of which I have bred in some numbers for many years past. The larvæ of *A. badiana*, when full fed, leave

the heads and spin their cocoons amongst the rubbish at the roots of the plant, while the larvæ of *P. lappella* fasten two or three of the seeds together, in which they hybernate and remain in the heads till the moths emerge. Another error appears to have been copied by one author from another respecting the larvæ of *Catoptria candidulana* (*wimmerana*), which are said to feed in the roots of *Artemisia maritima* in winter. The larvæ feed on the seeds of the plant in the autumn, and when full fed form their cocoons on the surface of the earth. I reared a fine series of this moth last season.—WILLIAM MACHIN; 29, Carlton road, Carlton Square, E., Feb. 20, 1887.

EARLY HISTORY OF *LITA KNAGGSIELLA*.—In response to Mr. Threlfall's request (*Entom.* 65), I beg to say that I did not take *Lita knaggsiella* freely at Haslemere. It was very scarce, and I doubt whether I took more than a dozen, certainly not a score altogether, although I worked very hard for it in successive years. I also spent hours in searching *Stellaria holostea* and *graminea* in the immediate neighbourhood of trees from which I had captured it, but never found a larva. The moth seemed to frequent oak trunks in places overgrown with bushes. It had, however, previously been reared from *Stellaria holostea*, in Germany, although mistaken for *junctella*, Dougl. It is recorded in the 'Entomologist's Annual,' 1866, p. 167.—CHARLES H. BARRETT, King's Lynn, March 9th, 1887.

PROTECTIVE VALUE OF COLOUR AND MARKINGS IN INSECTS.—At a meeting of the Zoological Society of London on March 1st, Mr. E. B. Poulton read a paper containing an account of his experiments on the protective value of colour and markings in insects (especially in Lepidopterous larvæ) and their relation to Vertebrata. It was found that conspicuous insects were nearly always refused by birds and lizards, but that they were eaten in extreme hunger: hence the unpleasant taste failed as a protection under these circumstances. Further, conspicuous and unpalatable insects, although widely separated, tended to converge in colour and pattern, being thus more easily seen and remembered by their enemies. In the insects protected by resembling their surroundings it was observed that mere size might prevent the attacks of small enemies. Some such insects were unpalatable, but could not be distinguished from the others. In tracing the

inedibility through the stages, it was found that no inedible imago was edible in the larval stage; in this stage therefore the unpleasant taste arose.

FERTILISATION OF FIGS BY INSECTS. — At a meeting of the Linnean Society, held March 17th, 1887, a paper by Dr. George King on the Indian Figs was read, in which it was shown that insects play a considerable part in the fertilisation of certain forms. Dealing with the structural peculiarities of the flowers in the genus *Ficus*, he specifies (1) male, (2) pseudohermaphrodite, (3) neuter, and (4) female fertile flowers. Besides these occur a set of flowers originally named by him "Insect-attacked females," but for which he has since adopted Count Solms-Lambach's term "Gall-flowers" (*Bot. Zeit.* 1885), this botanist having anticipated him in publication, though his own researches were of earlier date. As to the question of these gall-flowers, Dr. King states that the pupa of an insect can usually be seen through the coats of the ovary. The pupa when perfected escapes into the cavity of the receptacle by cutting its way through, and fully winged developed insects are often to be found in considerable numbers in the cavity of the fig. The pupa of the insect must become encysted in the ovary of the gall-flower at a very early period, for about the time at which the imago is escaping from the ovary the pollen of the anthers of the male flower is only beginning to shed. Thus Dr. King holds that through the interposition of insects the malformed female flowers doubtless become functionally important in the life-history of the fig-trees.

ACULEATE HYMENOPTERA OF CHESHIRE.—During the past three years I have worked up this interesting order of insects, and I think a list of captures, in this district, may prove interesting to the readers of the 'Entomologist.' I should like to know if any other collector has observed that the family Vespidae are attracted by *Cotoneaster microphylla* whilst in bloom.* Is it the flowers are the attraction, or, on the other

* [*Cotoneaster vulgaris* has long been known to hymenopterists as being very attractive to many of the Aculeate Hymenoptera, as also to many species of Diptera. The Vespidae were most probably in search of the larvæ of some lepidopteron, feeding on the plant, with which to store the cells for their young larvæ.—T. R. B.]

hand, is it the presence of minute insects? I could never prove either hypothesis satisfactorily, as the wasps, unlike the bees, would crawl away out of sight amongst the foliage as soon as they could, and the slightest disturbance would send them buzzing away. I caught scores of specimens, thinking I should find something or other in their mandibles, either for making the nest or as food for the young brood; but I could discover nothing whatever to enlighten me. I noticed that some kind of blight was present on the branches, but not in sufficient quantities as to lead me to conclude this was the attraction. However, I never worked a more profitable plant for Hymenoptera, as will be seen from the following list:—

Sphecodes gibbus, scarce, on hill-sides. *S. ephippia*, three specimens only, from various localities.

Halictus rubicundus, common, on flowers of *Doronicum plantagineum*. *S. cylindricus*, abundant, forming burrows in hard paths. *S. albipes*, scarce, from flowers of *Cotoneaster*. *S. smeathmanellus*, on hill-sides, under stones in their burrows.

Andrena albicans and *A. fulva*, abundant. *A. gwynana*, one specimen only, from flowers of *Cotoneaster*. *A. varians*, local, from flowers of *Doronicum*. *A. nigro-ænea* and *A. trimmerana*, abundant. *A. nana*, two specimens, from flowers of *Cotoneaster*. *A. afzeliella*, one specimen, from flowers of *Cotoneaster*.

Nomada ruficornis, local, from flowers of *Doronicum*. *N. alternata*, common. *N. furva* and *N. fabriciana*, one specimen only.

Stelis aterina, one specimen, from flowers of *Cotoneaster*. This rare and beautiful insect was taken by Mr. A. O. Walker.

Osmia rufa, common. *O. ænea*, local.

Megachile centuncularis, larvæ, common in old posts. *M. willughbiella*, local. *M. circumcincta*, found only on sand-hills.

Anthidium manicatum, local, on flowers of sage and thyme.

Anthophora acervorum, abundant; extremely fond of the flowers of the various species of *Aubretia*. *A. furcata*, two specimens of this rare insect.

Bombus muscorum, abundant everywhere. *B. cognatus* (*senilis*) and *B. distinguendus* (*fragrans*), scarce. *B. lapponicus*, extremely local (a nest of this beautiful insect was taken some years ago by Mr. Alfred O. Walker).

B. sylvarum, common. *B. terrestris* (*lucorum*), abundant everywhere. *B. derhamellus*, one specimen only. *B. pratorum* and *B. lapidarius*, common. *B. hortorum*, local; the variety *subterraneus*, scarce.

Apathus rupestris, common, from flowers of *Cotoneaster*. *A. campestris*, abundant, from flowers of *Cotoneaster*. *A. vestalis*, three specimens only, from flowers of *Cotoneaster*.

Vespa vulgaris, *V. germanica*, and *V. rufa*, common, from flowers of *Cotoneaster*. *V. arborea*; I took six females, all from the above plant, but have never yet seen a male. *V. sylvestris*, common, from flowers of *Cotoneaster*. *V. norvegica* (*britannica*), scarce, from flowers of *Cotoneaster*.

—R. NEWSTEAD; The Grosvenor Museum, Chester, February 23, 1887.

MACROCENTRUS INFIRMUS BRED FROM HYDRÆCIA PETASITIS.—In August, 1885, Mr. Pierce, of Liverpool, very kindly sent me a batch of cocoons, which he found in the stem of a burdock, in which *Hydræcia petasitis* had been feeding, and last autumn sent me a similar batch; I obtained, on September 9th, 1885, from the first batch 175 females, and from the last 122 males of *Macrocentrus infirmus*. It is often observed that when breeding from batches of Braconidæ cocoons that only one sex is produced; this has been particularly noticed with *Macrocentrus linearis* and *collaris*, their long ovipositors make the female so very conspicuous. — G. C. BIGNELL; Stonehouse, February 15, 1887.

XESTOBIUM TESSELLATUM, F., AT SUNBURY.—On July 5th last, while in quest of Coleoptera, I noticed that several of the willow trees growing in this district had been recently perforated with rather large holes. Having a small chisel, I quickly removed portions of the bark and examined the decayed wood, and was eventually successful in finding two excellent specimens of this curious beetle. — G. A. LEWCOCK; 40, Oxford Road, Islington, N.

PACKING UNSET LEPIDOPTERA.—Can any one tell me the best method of packing unset foreign Lepidoptera? as I have a friend who wishes to send me some from Africa.—GEORGE H. SMITH; The Theological College, Dorchester, near Wallingford, Oxon, February 24, 1887.

[Butterflies merely require to be placed, with their wings closed, in envelopes or small paper packets. They are killed by pinching the under side of the thorax. The papers, with their contents, should then be packed closely in tin boxes and sent home.—W. L. DISTANT.]

THE PRESERVATION OF SMALL LARVÆ.—Some few months ago I wrote a short query respecting this question, but it elicited

no reply. Perhaps some of your readers will kindly inform me if it is possible to preserve the minute larvæ of the Tortrices and Tineæ by inflation. If so, it must be an extremely difficult and tedious process. I had hoped that an easier mode might be in vogue, but I am afraid that my supposition was groundless.—A. E. HALL; Norbury, Pitsmoor, Sheffield.

PRESERVING THE COLOURS OF NEUROPTERA.—Can any of your readers kindly inform me how to preserve the colours of Neuroptera, and whether it is a difficult and elaborate process, requiring great dexterity of handling?—F. A. WALKER, D.D., Dun Mallard, near Cricklewood.

THE POST OFFICE AND EXCHANGE.—The enclosed has recently been issued by the Post Office. As the particulars relating to "compensation" may not be generally known to those who, like myself, go in largely for exchange, I would suggest your printing them in the 'Entomologist':—

Inland Parcels.—The rates of postage for inland parcels are 3d. for 1 lb., and 1½d. for every additional pound up to 11 lbs. The limits of size are:—Greatest length, 3 ft. 6 in.; greatest length and girth combined, 6 ft. Compensation for loss or damage to an amount not exceeding £1 will be given without payment of any special fee. For a fee of 1d. compensation will be given to an amount not exceeding £5, and for a fee of 2d. to an amount not exceeding £10.

Inland Registered Letters and Parcels.—Compensation for loss or damage to an amount not exceeding £2 will be given without payment of any special fee. For a fee of 1d. compensation will be given to an amount not exceeding £5, and for a fee of 2d. to an amount not exceeding £10. To secure compensation for damage of the contents of an inland registered letter or packet, the words "Fragile. With care" must appear on the cover. For a letter marked "Fragile. With care" the Postmaster-General reserves the right to select a route on which letters are neither received by nor delivered from trains in motion. The transit of such a letter in the post may possibly be less rapid than the transit of other letters.
—J. W. TUTT.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. *March 2nd, 1887.*—Dr. D. Sharp, President, in the chair. The Rev. Thomas W. Daltry, M.A., F.L.S., of Madeley Vicarage, Staffordshire; Dr. Neville Manders, of the Army Medical Staff, Mooltan, India; Mr. Alfred Sich, of Chiswick; and Mr. J. T. M'Dougall, of Blackheath, were elected Fellows. Mr. Slater exhibited, on behalf of Mr. Mutch, two specimens of *Arctia caja*, one of which was bred from a larva fed on lime-leaves, and the other from a larva fed on low plants, the ordinary pabulum of the species. The object of the exhibition was to show the effect of food in causing variation in Lepidoptera. Mr. H. J. Elwes exhibited a large number of Lepidoptera-Heterocera, caught by him in the verandah of the Club at Darjeeling, in Sikkim, at an elevation of 7000 feet, on the night of the 4th August, 1886, between 9 p.m. and 1 a.m. The specimens exhibited represented upwards of 120 species,—which was believed to be a larger number than had ever before been caught in one night,—including Bombyces of the genera *Zeuzera*, *Stauropus*, *Dasychira*, *Lophopteryx*, &c.; Noctuæ of the genera *Diphthera*, *Graphiphora*, *Gonitis*, *Plusia*, &c.; and Geometræ of the genera *Boarmia*, *Odontoptera*, *Urapteryx*, *Cidaria*, *Acidalia*, *Pseudocoremia*, and *Eupithæcia*. Mr. Elwes stated that Mr. A. R. Wallace's observations on the conditions most favourable for collecting moths in the tropics were fully confirmed by his own experience during four months' collecting in Sikkim and the Khasias. The conditions referred to by Mr. Wallace were a dark wet night in the rainy season; a situation commanding a large extent of virgin forest and uncultivated ground; and a whitewashed verandah, not too high, with powerful lamps in it. He said that on many nights during June and July he had taken from sixty to eighty species, and during his stay he had collected between 600 and 700 species. Mr. Elwes also made some remarks on the Khasia Hills, the southern slopes of which he believed to be the true habitat of the greater part of those insects described many years ago by Prof. Westwood and others as coming from Sylhet, which was situated in a flat cultivated plain, under water during the rainy season, and not many miles distant from these hills. In consequence of the

unhealthy and extremely hot and wet climate of these hills no Europeans had done much collecting there, but the specimens were chiefly caught by the natives and brought into the town of Sylhet for sale. A discussion ensued on the remarks made by Mr. Elwes, in which Mr. M'Lachlan, Dr. Sharp, Mr. Champion, Mr. Kirby, and others took part. The Rev. W. W. Fowler exhibited a specimen of *Cathormiocerus socius*, taken a few years ago at Sandown, Isle of Wight. Mr. S. Stevens exhibited specimens of *Cathormiocerus maritimus* and *Platytarsus hirtus*. Mr. F. Grut said he was requested by Mons. Péringuey, of Cape Town, to announce that the latter was engaged on a monograph of the genus *Hipporrhinus*, and that he would be glad to receive specimens and other assistance from British entomologists. Mr. Gervase F. Mathew, R.N., communicated a paper entitled "Descriptions of new species of Rhopalocera from the Solomon Islands." Mr. George T. Baker communicated the following papers:—"Description of a new species of the Lepidopterous genus *Carama*, together with a few notes on the genus," and "Description of a new genus of Rhopalocera allied to *Thecla*."—H. Goss, *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—February 24th, 1887. R. Adkin, Esq., F.E.S., President, in the chair. Messrs. J. E. Kelsall, J. Lea, and E. B. Nevinson were elected members. Mr. Tutt exhibited *Tephrosia crepuscularia*, Hb., from Hungary, and remarked that he was unable to obtain any forms of *T. biundularia* from there, although he had received it from Germany; he further showed continental forms of Agrotidæ and specimens of *Acidalia perochraria*, Fisch., and contributed notes. Mr. R. South, *Lobophora polycommata*, Hb. (bred this year). Dr. Rendall, *Calocampa solidaginis*, Hb., from Cannock Chase. Mr. Tugwell, English and Scotch forms of *Lycæna bellargus*, Rott. Mr. R. Adkin, *Notodonta ziczac*, L., *Dianthæcia capsophila*, Dup., *Aplecta prasina*, Fb., and *Eupithecia pumilata*, Hb., from county Cork, with specimens from various English localities for comparison. Mr. J. J. Weir read a paper "On Melanism" [an abstract of which appears at page 85 of this number]. Mr. George Smith, of the Sciopicon Company, then gave an exhibition of photo-micrographic slides, being photo-

graphs of the enlarged image of microscopic Natural History objects.

March 10th, 1887. The President in the chair. Messrs. D. J. Rice and H. H. Druce were elected members. Mr. Goldthwaite exhibited long series of male and female specimens of *Nyssia hispidaria*, Fb., bred by him this year. Mr. J. W. Slater, a variety of *Arctia caia*, L., having the red colour replaced by a yellowish or buff colour, and he stated that it had been bred by Mr. Mutch, of Hornsey, who had fed a number of larvæ on lime, and others on the usual food-plants of the species, with the result that those fed on lime were yellow varieties, the others being normal. A discussion then ensued as to the effect of strange foods in rearing varieties. Mr. R. Adkin exhibited *Zanclognatha tarsipennalis*, Tr., and remarked that nearly twelve months had elapsed between the escape of the larvæ from the eggs and the entrance into the pupa stage. Mr. Billups, *Tapinoma melanocephalum*, For., taken in the Palm House, Kew Gardens, on a species of palm (*Howea grisebachia*) from Tropical Australia, and he stated that it was the first recorded capture in Europe of this ant, and brought the number of exotic ants found in Kew Gardens by Messrs. Smith, Saunders, and himself up to seven species. Mr. E. Step contributed a paper on "Mosses," which was illustrated by diagrams and the exhibition of microscopical specimens.—H. W. BARKER, *Hon. Sec.*

REVIEWS.

The Larvæ of the British Butterflies and Moths. By the late WILLIAM BUCKLER. Vol. II. (The Sphinges or Hawk Moths, and part of the Bombyces.) Ray Society, 1886.

THIS volume contains 18 plates, and figures are given of the larvæ of our Sphinges, except those of *Naclia ancilla*, *Chærocampa nerii*, *Sciopteron tabaniformis* (*Trochilium vespiforme*), and *Sesia andreniformis* (*allantiforme*); and also the larvæ of the first 27 of our Bombyces.

The varied forms of the species figured, the grotesque shapes of some, and the richly-coloured appearance of others, have given

a scope to the efforts of both the delineator and the lithographer that the larvæ of the butterflies figured in the first volume did not offer. Plates XVIII. and XIX., in which the larvæ of the genera *Procris* and *Anthrocera* are figured, are amongst the least striking in appearance, but the minute markings which distinguish the different species from each other are most faithfully rendered, and one sees at a glance how little the mere colour of a larva enables a species to be distinguished; for instance, the five varieties of *Ino* (*Procris*) *statice*, given in Plate XVIII., bear little resemblance to each other; and none of the larvæ of *Zygæna* (*Anthrocera*) *filipendulæ*, figured in Plate XIX., are nearly so yellow as the type common on the South Downs, where the green form, here figured, is unknown.

Plate XXI. is singularly beautiful; the normal larva of *Acherontia atropos* and that of the red variety are given, well showing the great range of variation in this species. There are also three figures of the larva of *Sphinx convolvuli* in different positions, so that the markings are well shown. Plate XXIII. is quite gorgeous; eight larvæ of *Deilephila euphorbiæ*, in three stages of growth and with a wide range of variation in colour in the adults, are shown; all the minute details of the markings of this richly-decorated species are rendered admirably. Plate XXXIII. is excellent; five representations are given of that most singular, one might almost say comical-looking, larva of *Stauropus fagi*. Not only is this of the strangest shape, but it appears to have the habit of throwing itself into the most grotesque attitudes; it seems to be a veritable buffoon amongst Lepidoptera. Plates XXVII., XXVIII., and XXIX. give highly instructive details of the economy of the larvæ of the genera *Sphæcia* and *Sesia* (*Trochilium*); and although not possessing the beauty of some of the other plates, they are of greater interest from a scientific point of view. The work, indeed, may be characterised as excellent throughout. Mr. F. C. Moore has shown himself to be an accomplished entomological artist; the late Mr. Buckler's exquisite drawings have fallen into good hands; and the letterpress, under the able editorship of Mr. Stainton, is replete with information.—J. J. W.

Abstract of Proceedings of the South London Entomological and Natural History Society for 1886.

THE Annual Report of this Society for the past year extends to eighty-three pages, and contains a handsome plate by Mr. Frohawk, of some of the more interesting entomological subjects exhibited, the President's address, and abstracts of the proceedings of the meetings. The whole will be found worth perusal, as the pages contain much that is novel. We observe that the number of members has doubled during the year. The enterprise of the Society is such as to deserve every support, and it appears well on the way to become one of the leading Natural History Societies of this country.—J. T. C.

OBITUARY.

JOHN SANG.—Our readers will regret to hear that Mr. Sang, of Darlington, died suddenly at his residence during the night of March 19th, apparently having passed away in his sleep. Mr. Sang was at one time a successful linendraper of Darlington, and retired some years ago from business, with the intention of devoting the remainder of his life to the study of Micro-Lepidoptera. Having unfortunately become security for a friend, Mr. Sang was called upon to make good a large sum of money; this led to the sale of all his collections, which will be remembered to have taken place some few years ago in London. He had devoted much time to drawing the Tineina from nature, and this led to his afterwards, and up to the end of his life, being employed to delineate the British Coleoptera by Mr. Philip Mason, of Burton-on-Trent, and Mr. Sang developed an extraordinary gift in the work. The subject of this notice never published any very important work, but scattered communications from his pen will be found in the entomological periodic literature extending over many years. His age was fifty-nine, and we believe that he was never married.—J. T. C.

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NOTES ON THE GENUS *LYCÆNA*.

By RICHARD SOUTH, F.E.S.

(Concluded from p. 85.)

Lycæna eros, O.

THE male of this species is of a pale bluish-green on the upper surface, with fairly broad dark hind-marginal borders to all the wings, and black spots, sometimes but faintly indicated, on the margins of inferior pair. Normally there is no trace of a discoidal spot on fore wings, but two examples in my collection have short black lines at the external edge of discoidal cell, the position usually occupied by the discoidal spot. Venation blackish on hind margins of all the wings, and the same dark colour is, in one or two examples, projected into the white fringes. Female brown, with orange crescents on all the wings, sometimes only faintly exhibited. Black discoidal spot on fore wings. The under side coloration and arrangement of ocelli identical with the same characters in *icarus*. Normally there are two basal ocelli on fore wing, but in some specimens the lower, and in others both, are absent. Sometimes, too, the first and last eyed-spots of the central series are also absent. On the hind wings the discoidal spot is often without a black centre, and the white streak is always present, and, though often faint, sometimes extends from the orange crescents nearly to the discoidal spot.*

* The fifth basal ocellus, noted as occurring on the hind wings of some examples of *corydon*, *icarus*, and *bellargus*, is also to be seen in some specimens of *hylas*, *escheri*, and *eros*, as well as in such other species of *Lycæna* as *ægon*, *argus*, *cleobis*,

Larva unknown. A local species, occurring in mountain pastures at a moderate elevation in Switzerland, Tyrol, Savoy, Piedmont, &c.; also in the Pyrenees and Altai.

Var. *eroides*, Friv.—The male of this form is larger and more blue than the type. The hind-marginal borders are deeper and more clearly defined, and the spots on the hind wings larger. Under side characters are exactly those of typical *icarus*. My specimens are from South Russia and Pomerania. Both this variety and the type exhibit a shade of mauve when looked at from the side, but the mauve tint is especially noticeable in the Pomeranian examples of *eroides*. I have no female specimen of this form, but Mr. Kane says* it is "dark brown, with a few orange lunules at anal angle of hind wings."

Var. *candalus*, H.-S., occurs in Syria and Asia Minor. I have two males from the latter country, which respectively expand 0.75 in. and 1.0 in. In colour they closely approach male *icarus*, but they have rather indistinct linear discoidal spots on fore wings, similar to the examples of *eros* referred to above. The hind-marginal borders are but little, if any, broader than in some British *icarus*, and the under sides are exactly as in that species. Dr. Lang† describes the female as "dark brown, with a row of small orange spots on the hind wings, and with the bases of all the wings faintly blue."

Dr. Lang describes two other varieties of *eros*, viz., *myrrha*, H.-S.—"Somewhat like *eroides*, but much larger and paler in colour, the spots on the under side being proportionately smaller. Expands nearly 1.50 in. The female pale brown, with faint hind-marginal bands. Habitat, Asia Minor"; and var. *amor*, Staud.—"Size of the type. The male is light blue; all the wings with a narrow black border. Hind wings with a hind-marginal row of black spots; fringes white. Under side brownish grey. Fore wings with a discoidal and with a submarginal row of black spots; basal spots absent. Hind wings with three basal

zephyrus and var. *lycidas*, *astrarche*, *anteros*, and *arion*. Its situation on the inner margin is such that, in conjunction with the first three basal ocelli, it forms a curved series of eyed-spots. Occasionally the usual third and fourth ocelli are thrown out of line, when the last appears to belong to the central series, and increases the number in this series to eight, or nine if the last spot of central row happens to be a double one.

* 'Handbook of European Butterflies.'

† 'Rhopalocera Europæ.'

spots and a submarginal row; discoidal spot white; a marginal orange band between two rows of black spots. Female brown; bluish at the base. Fore wings with a discoidal black spot, and an indistinct marginal brownish band on the fore wings. Hind wings with a marginal orange band spotted with black. The under side much resembles that of *L. bavius*. Habitat, Samarkand."—'*Rhopalocera Europæ*.'

Comment on these last two forms of *eros* would necessitate reference to some other insects closely allied thereto, and which are considered distinct species. This would take me beyond the limit of my present purpose.

The resemblance between the females of the six species more directly considered in these notes is exceedingly close, and this fact alone should go far to convince anyone, who may be sceptical on the point, that all are descended from a common stock. But the males also have many identical characters, and are, moreover, intimately connected one with another by their several varieties. Giving full significance to both these facts, I am inclined to suppose that not only have all the six been developed from the same stock, but that they have been developed in a single line of descent. Although the type forms of male *corydon* and *bellargus* are distinct enough, we have seen that there are local forms of each which are not so readily separated. Such forms closely associate the two insects, and, in conjunction with the further fact of the larvæ of both being almost exactly identical, establishes their blood-relationship. Then we have male *icarus* with *bellargus* colour on the one hand, and others with black spots on the hind margins of inferior wings. These spots are found in males of both *bellargus* and *hylas*, but are not constant in either species, and the normal colour of *hylas* is close to that of *bellargus*. Thus *icarus*, *bellargus*, and *hylas* exhibit evidence of consanguinity. *Eros* is associated with *icarus* by the ornamentation of its under surface, and by the var. *candalus*. Male *escheri*, like the same sex of *icarus*, varies in the coloration of its upper surface. Sometimes its colour is like that of *bellargus*, but more frequently it favours *icarus*, and there are often black spots on the hind wings. The under-side colour of some examples approximates to that of *icarus*, and in others to that of *bellargus*.

In discussing the under-side ornamentation of the several species, the occurrence of a white triangular dash or streak has

been referred to in each case. Whatever modification there may be in the number, size, or arrangement of ocelli or orange crescents on the under surface of the several species or individuals of one species, this white streak is always found occupying the same relative position. Often, in consequence of pale coloration of the hind wings, the character is not well defined; but in specimens with dark-coloured secondaries, such as that figured, Pl. II., fig. 7, it generally stands out boldly. This white streak may be a feature in course of development, but I am rather disposed to consider it an ancestral character. The same kind of mark is found in a similar position on the hind wings of several species of *Lycæna*, besides those under consideration; but I do not propose referring further to these than by instancing *damon*, Schiff., which has a white streak of stripe-like proportions; and *astrarche*, Bgstr.

Eumedon, Esp., has a white streak, but this is in the form of a ray from the external edge of discoidal spot of hind wing, passing beneath the third and fourth ocelli of central series. Traces of a similar ray are found in several examples of *amanda*, Schn., and of all the species previously mentioned, except *damon*.

The marginal borders, discoidal and hind-marginal spots on the upper surface of the males are, I think, like the white streaks on the under sides of both sexes, remnants of an ancestral form; and, in accordance with this view, I should suppose that both sexes of the original stock, from which several species of *Lycæna*, including those with which we are chiefly concerned, have descended, were dark brown or blackish on the upper surface, with fringes but little paler, and probably discoidal spots on all the wings. The first ornamental characters acquired by both sexes were probably white or orange bands; these afterwards becoming modified, but chiefly in being broken up into crescents, when ocelli would also be formed on the hind margins. Then some shade of blue would appear by degrees on the upper surface of the males, and here "sexual selection" would play its part, as the females would choose partners which best pleased their fancy; and each female that had mated with a blue male would transmit to its offspring the particular shade of blue of its consort. Thus in time races would be established, and the descendants of the original stock divided. During the course of these developments modified descendants of the original stock would have been

distributed over a wide area, and in the various new localities occupied would have to compete for existence with other animals already established therein. The survival and increase or deterioration and extinction of a form in any situation would depend upon the ability of such form to adapt itself to its surroundings, and here "natural selection" would exert a controlling influence; but this influence would operate principally in perpetuating, the most suitable colour and style of ornamentation on the under surface of the wings.*

The most ubiquitous species in the group is undoubtedly *icarus*. This is the dominant form, and from the fact of its occurring in high latitudes at the present day we may infer that it was among the earliest to migrate northwards. The first portions of Great Britain inhabited by *icarus* were probably Scotland and its islands, from whence it extended into Ireland. The progenitors of Scotch and Irish *icarus* would have come through North-west Europe,—at the time our islands formed part of the continent,—and were presumably of a more robust character than the individuals which subsequently came into England through France. The species would appear to have possessed a wonderful power of adapting itself to circumstances, as it is found to be established in all kinds of situations, and in a variety of climates. In the course of its migrations, *icarus* would found colonies on mountain and in valley, and some of these colonies would, as time went on, become isolated. Any aberration obtaining largely among the individuals so isolated would become specialised, and a new form developed. Many such forms have probably existed, but are now extinct; others are exceedingly local, and so greatly modified that their origin is unsuspected; whilst another, *hylas* to wit, although apparently independent of

* In whatever way a particular shade of blue was acquired by the males, sexual selection, acting through the choice of the female, would determine the continuance or suppression of such colour. Natural selection would regulate the adornment of the under side of both sexes; so that although a male might have the upper surface coloured as in *eros* var. *eroides*, for instance, the reproduction of this colour in the descendants of such male would not necessarily involve any change in the under-side colour or marking, so long as those characters were in harmony with the insect's surroundings. On the other hand, some variation in one or other of the under-side characters of an insect, say *icarus* var. *icarinus*, might confer certain advantages in a particular locality, and such modification would assuredly be repeated in the descendants of that insect, but without any concurrent change in the colour of upper surface.

icarus in some localities, is still associated with it by forms occurring in other localities, as, for example, in Ireland and Scotland. *Escheri* and *eros* may be species in the ordinary acceptation of that term, but they are not so distinct from *icarus* as are *pheretes*, *orbitulus*, and *anteros*, descendants of the same original stock, but by another line of which *astrarche* is the dominant form. *Corydon* and *bellargus* probably stand in the same relation to each other as do *icarus* and *hylas*.

When considering the under-side variation of *corydon* (*ante*, p. 8), I suggested that if individuals varying little or much in any one direction could be removed apart, the type of aberration, possessed in different degrees by the individuals set down, would become specialised. Of course such a result would depend (1) on the locality selected for colonisation being a suitable one, and (2) on the new colony being free from any chance visits of the typical or other forms of the species. Suppose, however, some such experiment to have been successful, and a race of more or less uniform aberrations to have been developed, we should still find that the earlier stages of the aberration would occur among the type form, and these minor varieties would connect the aberrant race with its parent type. Of course in this case, from our knowledge of its origin, we should not consider that we had established a new species; but if such a race had been developed in the ordinary course of evolution,—I mean without man's assistance,—we should have no knowledge of its history, and consequently should have some difficulty in determining its rank. Should we, however, know that examples of an allied species occasionally varied in the direction of the special character of this race, we should, I think, be justified in assuming that it was a local form of the species among which similar aberrations occurred. A case in point is that of *L. eros* var. *candalus*. Some entomologists consider this a distinct species, whilst others only allow it to be a form of *eros*. Whether considered as a species or a form of *eros*, or even of *icarus*, it is equally interesting as an example of one of the modifications which have occurred from time to time in the development of the several insects we have had under consideration. Why certain forms should be selected for specific rank, and others, which have distinctive characters of equal merit, be considered merely local varieties, I know not. Take *corydon* var. *albicans* for example. Does anyone see specific

characters in this insect? It is quite as distinct from typical *corydon* as typical *hylas* or *eros* are from *icarus*. Is there any fixed rule to guide us in determining the exact point at which a variety merges into a species? I am not aware of any such rule. In fact I doubt if any set of rules could be framed which would meet the requirements of all cases. I agree with those who consider an aberration as the first stage, as it were, in the development of a species; but I hold the opinion that a local form, however greatly it may have become modified from the type, cannot legitimately rank as a species, whilst individuals occurring among either the local or type forms can be found to connect the two.

In conclusion, I may say that I regret being unable (from want of material) to enter into a consideration of some other species and forms of this most interesting but perplexing genus. I can only hope that at some future time, when I may have extended my series of certain species and obtained some local forms, I shall be able to add a few further notes on the genus *Lycæna*.

NOTES ON SILK-PRODUCING BOMBYCES—1885.

BY ALFRED WAILLY.

(Membre-Lauréat de la Société d'Acclimatation de France.)

In my previous reports on the rearings of wild Silkworms and other exotic Lepidoptera, I have invariably spoken of the cold weather, or sudden changes in the temperature, as one of the two great impediments in the way of their successful rearing in the open air or indoors at the ordinary temperature. In 1885 the weather was even more unfavourable than in previous years. The months of May and June were so cold that the emergence of moths from the cocoons was delayed several weeks, which created such a disturbance in the economy of the insects that many of the eggs obtained were infertile. Cocoons, such as those of *Attacus atlas* (Ceylon race), all died, and out of a large number of *Cricula trifenestrata* only three moths emerged. British Lepidoptera were affected in a similar manner, although not so much as exotic species. I shall therefore, in future, keep the cocoons at a warm and even temperature from the beginning

of April till all the moths have emerged and the larvæ hatched, especially if the latter are to be reared in the open air.

The other great enemy is the common house sparrow, that useless pest, of which so many have to complain. The sparrow destroys everything that is good, and nothing else but what is good, and it gives nothing in return.

In 1885, as in 1884, I should in all probability have had a very successful rearing of the valuable oak silkworms, *A. pernyi* and *A. yama-mai*, had not the sparrows destroyed them all on two different occasions. The larvæ of *A. pernyi* had hatched from eggs sent from Spain, *A. yama-mai* from eggs sent from France. They were on trees covered with netting which was in very bad condition, and the sparrows managed to get through as soon as they had perceived the larvæ. The netting was mended, and a second lot of larvæ obtained from my own moth were placed on the trees, but these had the same fate, the crafty sparrows always finding a little opening to get under the netting.

From the experience acquired after rearing for a number of years various species of wild silkworms, we come to the conclusion that *Antheraea pernyi* (the North China oak silkworm), and *Attacus cynthia* (the Ailanthus silkworm), also a native of North China, are by far the easiest to rear on a large scale in northern countries. *Telea polyphemus*, of the United States of North America, succeeds also very well in the open air, but the propagation of this species is difficult, and so is that of *Attacus yama-mai*, the Japanese oak silkworm.

A silk manufactory in Lyons has offered to purchase samples of empty or dead cocoons of all species of wild silkworms, for the purpose of testing their qualities; after these experiments, immense quantities of empty cocoons will be purchased of all good wild silks. I shall, therefore, be happy to receive communications from persons in all countries where these wild silkworms can be reared easily on a large scale, and to obtain from them samples of from ten to twenty pounds in weight of empty or dead cocoons of each species. Communications to be kindly sent to me at Norbiton, Surrey.

I shall now mention some of the species which were reared in 1885. Several of my correspondents succeeded in rearing such species as *A. yama-mai*, *A. pernyi*, the hybrid *roylei-pernyi*, *Actias luna*, *Callosamia promethea* and *cynthia*; some were

unsuccessful owing to various causes, others have not sent the results of their experiments.

With respect to my own experiments, the species which I had in the open air, *A. yama-mai*, *A. pernyi*, and *roylei-pernyi*, were entirely destroyed by the sparrows as above stated, the netting I have over some trees being now entirely rotten. Besides this, having been in Paris during the month of August, I had to discontinue the rearings in the house at the end of July; these had gone on in a very satisfactory manner, till most of the larvæ were sent to various correspondents.

Antheræa yama-mai, Guérin-Méneville (Japanese oak silkworm).—This valuable species, which forms a beautiful cocoon, yellow or green, similar in shape to that of *Bombyx mori*, was, during a certain number of years, cultivated in several European countries. The greatest hopes were entertained respecting the ultimate success and acclimatization of this Japanese silkworm, which was going to transform our oak leaves into silk. But gradually all these hopes vanished as two great difficulties stood in the way to success: the eggs generally hatched before the breaking out of the oak buds, and the moths, for the most part, refused to pair in captivity. So every year the rearings went on a decreasing instead of an increasing scale, till at last the species disappeared almost entirely. In Spain, however, the rearers of this species had been remarkably successful, and the worms were bred for several years in immense quantities in the oak forests on the estates of the Marquis de Riscal, in the province of Cáceres, Estremadura. At the Paris International Exhibition, in 1878, large quantities of *A. yama-mai* cocoons were exhibited. Unfortunately, one year, in the month of May, a night frost destroyed the young oak leaves on which the thousands of worms were feeding, and starvation was their fate. After this unexpected disaster, the rearings were entirely abandoned.

In the meantime, while the *A. yama-mai* was gradually disappearing, a formidable rival had made its appearance; that was *Antheræa pernyi* (the Chinese oak silkworm), introduced into France, like *A. yama-mai*, by Guérin-Méneville.

From that time the Chinese *A. pernyi* was reared in preference to the Japanese *A. yama-mai*, the latter being abandoned almost entirely; and what was the cause of this? The cocoons

of both species are closed, that of *A. pernyi* being the larger; and their silk, which can be reeled, is very likely of equal value. But *A. pernyi* had two great advantages over *A. yama-mai*: the moths paired readily in-doors as well as out-of-doors, and the worms hatching in May at the earliest, and in June in moderate climates, have a good supply of food as soon as they hatch.

As it is well known, the *A. yama-mai* hibernates in the ovum state, or rather in the larval state, the larvæ, fully developed about two or three weeks after the laying of the eggs, remaining in the egg from the month of August or September till the spring. The first difficulty with the rearing of *yama-mai*, was the supply of food as soon as the hatching of the worms commenced, and it often took place before the breaking out of the oak buds as above stated.

Now this difficulty can be overcome, as it has been found that the young *yama-mai* larvæ can feed on hawthorn and hornbeam (*Carpinus betulus*), the foliage of which is earlier than that of the oak. Very likely it might feed also on some other kinds of foliage till the oak leaves make their appearance. Small, gently-forced oak trees in pots might also be used. I must also add, that if the *yama-mai* eggs are kept in the open air all the winter in a northern aspect, and protected against the rays of the sun, they will seldom hatch before the oak trees break into foliage; if so, it will only be a matter of feeding the worms for a short time on a foliage different from their natural one.

Coming next to the second great difficulty, that of the reproduction of the species, it must be stated that the pairing of the moths will easily take place if the cages containing the moths are placed in the open air instead of in rooms, as it was done by entomologists or amateur sericulturists. One of my French correspondents, an eminent and most skilful breeder of silk producers, has always been successful with his *yama-mai*, which he has propagated from the same stock ever since he commenced with this species. He places his young *yama-mai* larvæ in the open air on oak branches, immediately they are hatched, whatever may be the state of the weather; they can resist the frost. These few particulars may induce some entomologists to try again this very interesting silkworm. The *yama-mai* ova I had in 1885, hatched from April 1st; they were fed during a few days on hawthorn and hornbeam, but seemed to prefer the latter.

On the 26th they were placed on the little oak trees in my garden, the trees being under a large framework covered partly with wire, partly with fish-netting. The fish-netting had become so rotten that sparrows got in and destroyed all the larvæ I had, as I mentioned before. The *yama-mai* larvæ were in their last stage and in splendid condition; they were destroyed about the middle of June, all on the same day. The second stage of the larvæ commenced on May 11th; the third stage on the 28th; the fourth on June 3rd; the fifth about June 14th. There were about four dozen worms.

It may be of importance to record the following fact: On the 4th or 5th of May there was a sudden change of temperature, the weather turned cold and wet. Some of the *yama-mai* worms had been placed on young shoots or suckers, which had started from the crowns of oak trees, the stems of which had perished after the moving of the trees to their new quarters. In consequence of this sudden change of weather, I covered with a large bell-glass the suckers of one of the little trees, on which I had placed eighteen young larvæ, to watch their progress, and see if they would grow faster or better than those which had been left entirely unprotected. Some days after, I perceived a large quantity of ants under the glass; there was a nest at the root of the tree. This was a very unpleasant discovery. What was I to do under the circumstances? I wished the larvæ to remain on the foliage, which grew splendidly under the glass; on the other hand I was afraid the ants would destroy the little worms. I took half a dozen worms away, and left the others to take their chance with the ants, which went over the leaves and everywhere under the glass. The larvæ, however, continued to thrive; not one disappeared; the ants crawled over them, but never did them any harm. It has been often stated that ants are very destructive and dangerous to young silkworms, but on this occasion no harm was done. Had the cold and wet weather paralysed or weakened their organs so as to make their biting powerless? Therein may be found the true cause. However it may be, it is some consolation to know that ants are not at all times such dangerous enemies as one might suppose.

(To be continued.)

THE PRESERVATION OF LARVÆ BY INFLATION.

By J. W. TUTT, F.E.S.

MR. HALL asks (Entom. 114, 115) whether "it is possible to preserve minute larvæ by inflation."

As I have preserved a very great many larvæ by inflation without any serious difficulty and on a very simple plan, I think I may say it is quite possible. Of course a great deal of tact and care is required in the manipulation of the smaller ones, and, however careful one may be, I think it impossible to preserve them without spoiling one now and again, but they can be done with extreme rapidity when once mounted; and the process I adopt is neither "difficult nor tedious." At the same time, I do not see the scientific value of preserving small larvæ, and have altogether given up doing so. Among our Tortrices and Tineæ, especially among the smaller species, the small points of difference between closely-allied species are, even in well-preserved specimens, well-nigh lost, and a good drawing or description of one's own, made from the actual living larva, is, in my mind, of much greater value. The coloration and markings of many minute larvæ are dependent, to a great extent, on the alimentary canal and the dorsal vessel, especially the former, the actual outside membrane being, when the viscera have been taken out, almost transparent and devoid of its natural coloration. For this reason, the murder of the little fellows seems unattended with any positively good result; hence, as I have previously stated, I have abandoned the plan of preserving or inflating these larvæ when there seems no scientific return for my trouble.

Many of the Geometers also fall under the same category; but there are in this group some striking exceptions, the genus *Eupithecia* standing out conspicuously. The colours and markings of most of these larvæ are retained in their entirety, and the rate at which one can do them is surprising; their bodies are so small that they dry almost immediately. I think anyone with practice could inflate at least twenty specimens of *E. oblongata* (*centaureata*) in an hour. I have inflated five of that species and five of *E. absynthiata* in less than half the time.

The preserved larvæ of Bombyces and Noctuæ, however, add great interest to a collection. Their colours are generally retained

in the same condition as during life. Those species where the larva is thickly covered with hairs have the most natural appearance, and give no trouble whatever. It is only larvæ which retain their natural appearance which seem to me worth preserving.

I have seen a great deal written about preservation of larvæ by inflation, and almost fear to go over such well-trodden ground; but, although nothing to do with Mr. Hall's query, I venture to hope that the following system, adopted by me with success, may be of use to some of the readers of the 'Entomologist.' The system will, I venture to say, bear comparison for simplicity with any other method. A few glass-tubes of small bore (say quarter of an inch), a piece of India-rubber tubing, a small steel spring, and a wide-mouthed lamp, are all that is required. The spring can often be dispensed with, a piece of fine cotton being used instead. The *modus operandi* is as follows:—Put the glass tube into a powerful flame, taking hold of one end of the tube in each hand. Then, as the glass begins to melt, draw it carefully out, when a half of the tube drawn out to a fine point is left in each hand. The extreme point (being closed) is then broken off, and you can then blow completely through it. Now fix a piece of India-rubber tubing on the broad end, thus:—



a. Spring. b. Glass tube. c. India-rubber tubing.

On the narrow end of the tube fasten a small spring made of a piece of bent steel, which can move only up and down in a vertical direction. This is to hold the anal flap of a larva when placed on the tube (the end of the spring must fall on the extreme edge of the point).

The instrument is now ready for use. Having fixed the eviscerated larva by inserting the fine end of the tube into the anal orifice, let down the spring on the anal flap. This holds it in position. Place the free end of the India-rubber in your mouth and blow gently through; the larva at once expands to its natural size and, generally, form. Then hold it over a broad-

mouthed lamp, where the heat is not too concentrated (the distance from the mouth of the lamp is soon learned by practice), and keep the tube filled with air. There may be some difficulty at first, but I find none, in breathing through the nostrils and keeping up sufficient pressure with my mouth at the same time. With a large larva the process of drying takes much longer, but the pressure of the finger and the thumb on the India-rubber tube keeps the air in the glass tube and the body of the larva. Care must be taken to fill the tube with air again before the finger and thumb are removed, otherwise the larva will partially collapse, and is then likely to be of little value. Great care must be taken to thoroughly dry the larva before removing it from the tube, otherwise the larva will partially collapse after it is removed, when it is next to useless to attempt to do anything with it. In removing the larva from the spring, it is sometimes necessary to slightly moisten the anal flap, which occasionally adheres to the tube.

The evisceration of the larva wants a little care. I find the following the best plan:—Insert a fine needle into the anal orifice, then move it from side to side and up and down, so as to break the membrane forming the alimentary canal. Then lay the larva on a pad of soft blotting-paper (to absorb the moisture), and with a small roller—a bone pen-holder will do very well—commence rolling gently towards the anal orifice, beginning a short distance from it. Gradually increase the distance, until at last you roll from the head to the anal segment. If an attempt be made to force the whole of the viscera out at once the pressure will break open the integument, the anal orifice being too small to allow a free passage.

The above is a rather rough-and-ready method, but it involves little or no outlay, is no trouble to get ready, never gets out of gear, and does the work, as far as I can judge, as well as any other system. If anyone cares to try the plan, I should be pleased to give any explanation, as far as I am able, if there is any difficulty arising from want of clearness in the above remarks.

Rayleigh Villa, Westcombe Park, S.E.

[See also a paper "On the Preservation of Lepidoptera Larvæ by Inflation," by C. H. and H. M. Golding-Bird; *woodcuts* (Entom. x. 255). Although Mr. Tutt's remarks *there anticipated*, we give them for the use of new readers.—

ENTOMOLOGICAL NOTES, CAPTURES, &c.

RETARDED EMERGENCE OF *PAPILIO MACHAON*.—Having reared a quantity of *Papilio machaon* from larvæ, I can add my testimony to the fact that a considerable percentage of the imagos do not emerge until the second year. Occasionally they do not emerge for a period of three years, in which event they are nearly always crippled. Whether this is the case in a state of nature it would be very interesting to ascertain.—W. HARCOURT BATH; Ladywood, Birmingham.

LATE APPEARANCE OF *EUCHLOË CARDAMINES*.—There have been some notices of the late appearance of this insect (Entom. 63, 106). I think the insect is generally on the wing late in June and early in July, but more frequently the late specimens are females, and hence are overlooked. Males do not occur late so frequently, but when they do occur they are so conspicuous that the fact is at once noted. During the first week of July, 1881, I took half a dozen females, but never saw a male during that time. The following July I took a male as late as the 16th, but saw none after, either males or females. The latest dates I have noticed since do not extend beyond the 8th of July, but I find an occurrence in the July of each year, except 1886, when all the *cardamines* I saw amounted to two. These were seen during Whit-week.—J. W. TUTT; Rayleigh Villa, Westcombe Park, S.E.

VANESSA ANTIOPA WITH WHITE BORDERS.—I am just in receipt of the enclosed letter from my friend Mr. Wurzburger, of Creuznach, Rh. Prussia, an enthusiastic collector of Lepidoptera, relating to *Vanessa antiopa*. On seeing the specimens of this butterfly, of which I have several in my collection, all of which without doubt have been captured in Great Britain, and on my remarking that many entomologists considered the white borders which each possesses indicated a certain guarantee of their genuineness, he seemed highly amused, and confirmed the feeling I have always had myself, that the white borders had nothing to do with the question. The enclosed letter is so interesting that I forward it for publication to the 'Entomologist.'—S. J. CAPPER; Huyton Park, Huyton, April 15, 1887.

"Hereby I enclose two *Vanessa antiopa* (with white borders), which, among others, I caught this morning near our town, at

the border of a forest. *V. antiopa* hibernates, and appears in spring, together with *V. polychloros*, *V. urticæ*, *V. c-album*, &c. (also *Gonepteryx rhamni*). When the butterfly leaves the chrysalis in July it has a yellow border; in spring its border is paler, sometimes light yellow, often quite white. I caught four *V. antiopa* this morning; one of them had a yellow border, turning white at the outer side. I saw two or three more flying. I often noticed that later in spring (May or even sometimes early in June) the borders of *V. antiopa* are perfectly white, all the yellow colour having faded. You may be quite sure that those specimens of *Vanessa antiopa* which sometimes have been caught in England have come from the Continent, and are hibernated specimens having white borders. No caterpillar of *V. antiopa* ever has been found in England. The hibernated butterflies never are quite perfect; the wings are always more or less broken.—M. WURZBURGER; Creuznach, Rh. Prussia, April 10, 1887."

VANESSA ANTIOPA IN SUSSEX.—On the 20th August last a boatman caught a specimen of *V. antiopa* at St. Leonard's-on-Sea. The beautiful insect had settled on his coat while on the beach. It had a yellow border, so I suppose it had blown over from the Continent. It is now in my collection.—A. J. FIELD; 145, Isledon Road, Seven Sisters' Road, Finsbury Park, N.

VANESSA C-ALBUM, &C., IN NORTH WORCESTERSHIRE.—On Good Friday, April 8th, I visited a locality in North Worcestershire, and met with *Vanessa c-album* in abundance, flying in company with *Vanessa io* and *Gonepteryx rhamni*. They all seemed to prefer the sheltered valleys and open spaces in woods.—W. HARCOURT BATH; Ladywood, Birmingham.

VANESSA C-ALBUM IN SUSSEX.—Whilst collecting larvæ of Micro-Lepidoptera on April 11th, between Shoreham and Bramber, I was fortunate enough to capture a fair specimen of *Vanessa c-album*, being, I believe, the first taken in the county of Sussex for many years.—A. C. VINE; Temple Street, Brighton, April 18, 1887.

APATURA IRIS IN THE FOREST OF DEAN.—This insect used to be taken occasionally about twenty years ago in the Forest of Dean in Gloucestershire, but I have heard of no recent capture. Can any reader of the 'Entomologist' inform me of the occurrence

of this insect in the above locality within the last decade?—
W. HARCOURT BATH; Ladywood, Birmingham.

ZEUZERA PYRINA.—In reply to the latter part of the question concerning *Zeuzera pyrina* (Entom. 108), I beg to say that the insect is fairly common in this neighbourhood. The larva is particularly partial to pear trees, and I found one in March, 1878, in a small branch of whitethorn. The moths may occasionally be seen at rest on affected trees, and I think are easily attracted to light, as two or three specimens that I have had were found near gas-lights.—ALFRED SICH; Burlington Lane, Chiswick, W., April 9, 1887.

ZEUZERA PYRINA (*ÆSCULI*).—In answer to the questions (Entom. 108) relative to *Z. pyrina* (*æsculi*) as regards locality, J. F. Stephens, writing in 1829, says, "Often taken in and near London"; and the Rev. F. O. Morris, in his book of 'British Moths,' mentions "Hyde Park and St. James's Park, and other parts near London," for this species. I remember picking up, some seventeen years ago, a female at the base of an old elm in Kensington Gardens. Perhaps Mr. H. Sharp will tell us whether the species is still common in London, when he publishes his list of Lepidoptera taken within five miles of the Marble Arch, promised Entom. xviii. 78. As to food, Mr. O. S. Wilson, in his work on Larvæ (1880), enumerates twenty distinct kinds of trees inhabited by *Z. pyrina*, but does not include birch among them. The Rev. F. O. Morris, however, who only enumerates ten, mentions birch as a food. Combining their lists we get a total of twenty-three kinds. As guelder-rose, holly, lilac, box, and hazel are mentioned by these writers, the larva apparently infests small trees as well as big. In Entom. vii. 138, there is an account of some in a small Siberian crab-tree, four inches in circumference.—H. CHITTY; 33, Queen's Gate Gardens, S.W., April 6, 1878.

ZEUZERA PYRINA IN MARCH.—A cousin of mine captured a female of this species on March 3rd, 1887, about half a mile from the centre of this town. The moth was found in some straw which had been placed around a rose tree in his garden. My cousin, unfortunately, not being a naturalist, roughly killed the moth and put it in a box for me. When I opened the box in which it had been placed I found a few eggs had been deposited,

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but the insect was of course worthless. I am at a loss to understand *Z. pyrina* being out so early, as I believe it does not generally, if ever, hibernate in the perfect stage. Perhaps some of your readers, however, may be able to explain the cause.—A. E. HALL; Norbury, Pitsmoor, Sheffield.

GREEN PUPA OF *PLUSIA GAMMA*.—In August, 1883, I found a pupa spun up in a bramble-leaf at Colwyn Bay, North Wales. The pupa was of the shape and size of that of *P. gamma*, but of a beautiful light green, the cocoon being white. The pupa was found about August 26th, and retained the green colour until September 1st, when it passed successively through yellowish green, pinkish brown, and on to black (with the *gamma* showing plainly through the pupa-case). It remained black from September 3rd to 5th, when an ordinary *P. gamma* emerged. The specimen differs, so far as I can see, in no way from the ordinary type. After emergence the pupa-case remained light brown. I had never heard of the pupa of *P. gamma* being green before, and, not having met with a similar case since, I now place it upon record, and shall be pleased to hear if any of your readers have met with such an occurrence. I made a note of the foregoing at the time, and the moth is set apart in my cabinet.—J. GÜNTHER; Oldham, April 9, 1887.

PLUSIA NI IN HAMPSHIRE. — As *Plusia ni* seems to be uncommon, it may be interesting to record the capture of a fresh specimen of this insect near Bournemouth on August 10th, 1885.—B. G. NEVISON; 2, Elm Villas, Heath Street, Hampstead.

HELIOTHIS ARMIGERA IN LEICESTERSHIRE.—I took *H. armigera* on a young tree in a street in Leicester on Oct. 8th last.—B. G. NEVISON, 2, Elm Villas, Heath Street, Hampstead, April, 1887.

LARVÆ OF *CROCALLIS ELINGUARIA*.—On August 21st I found a female of *C. elinguaris* on a lamp. On opening the box the next morning I was pleased to find a batch of eggs, the larvæ of which are only just emerging. I should like to know if this is usual, as Newman's book on 'British Moths' says it lives throughout the winter in the larva state, about half grown.—W. E. BUTLER; 91, Chatham Street, Reading.

AGRIOPIS APRILINA.—I can corroborate, from my own experience, what Mr. G. M. Howell writes (Entom. 110) respecting

the "tying of the tibia and tarsus together" of the fore legs of *Agriopis aprilina* after being killed. Whether the same result may obtain upon natural death I cannot say. It is well-nigh impossible to get the fore legs into a proper position when the moths have been poisoned, although the wings may be beautifully relaxed, and in endeavouring to get them out it generally happens that the whole leg is torn from the body.—JOSEPH ANDERSON; Chichester.

[I think if our correspondents would use strong ammonia for killing their specimens the stiffness complained of would not occur. If properly used even the green of *Agriopis aprilina* would not be affected by this agent.—J. T. C.]

HYBERNIA MARGINARIA var. FUSCATA.—The variety *fuscata* of *H. marginaria* (*progemmaria*) seems to be generally distributed throughout the Birmingham district, having been taken by myself in several localities, but is by no means common. Is *fuscata* a North of England form only, as I have never heard of its capture in the South (below lat. 52°)? Perhaps some of your readers can give information upon this point.—W. HARCOURT BATH; Ladywood, Birmingham.

EPHESTIA KÜHNIELLA IN BRITAIN.—I write to say that I sent specimens of the moths bred from rice-cones, and recorded (Entom. 66) as *Myelois ceratonie*, to Mr. Barrett, who writes me saying they are of a species new to this country, viz., *Ephestia kühniella*, which was discovered in Germany about seven years ago by Professor Zeller, who found the larvæ feeding on wheat-flour. It has now found its way to this country, and possibly may become troublesome, having got into the bakers' meal-rooms about here. The moth is a large and handsome species.—W. THOMPSON; 183, Stantonbury, Stoney Stratford, Bucks, April 7, 1887.

CLASSIFICATION OF COLEOPTERA.—At a meeting of the Zoological Society of London, held April 5th, a communication was read from the Rev. H. S. Gorham on the classification of the Coleoptera of the division Langueriides. The author pointed out the characters which, in his opinion, were available for the systematic arrangement of this family of Coleoptera, and for its division into genera. The subject had hitherto not received the attention it deserved, and several errors had gained currency,

owing to the hasty and insufficient way in which the structure of these insects had been analysed. He added an analytical table of about forty genera, many of those proposed being new.

ERRATUM.—In *Lepidoptera of South Buckinghamshire*, p. 90, 6th line from foot, for *N. rhomboidea* read *N. stigmatica*.—J. SEYMOUR ST. JOHN.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*April 6th, 1887.* Dr. David Sharp, M.B., F.Z.S., President, in the chair. Mr. Francis Galton, M.A., F.R.S., of 42, Rutland Gate, S.W.; Mr. John Henry Leech, B.A., F.L.S., of 10, Hyde Park Terrace, W.; and Mr. George S. Parkinson, of Percy Cross, Fulham, S.W., were elected Fellows. Mr. Samuel Stevens exhibited specimens of *Arctia mendica*, collected in the county of Cork, by Mr. M'Dowell, of Manchester. The peculiarity of the Cork form of the species is that the majority of the males are as white as the female of the English form; and although smoky-coloured specimens occur intermediate between the Irish and English forms, the typical black or English form appears to be unknown in Cork. Mr. M'Lachlan exhibited a zinc box used by anglers for the purpose of keeping living flies in, which he thought might be adapted to practical entomological use in the field. Mr. George T. Porritt exhibited a large number of specimens of *Hybernica progemmaria*, bred from moths collected at Huddersfield last spring. All the females and a large proportion of the males were of the dark variety *fuscata*, which formerly was almost unknown in Yorkshire, but which now seemed likely to replace the paler and original type. Mr. Jenner Weir and Lord Walsingham both remarked that the number of melanic forms appeared to be on the increase in the north, and suggested explanations of the probable causes of such increase. Mr. Gervase F. Mathew, R.N., exhibited several new species of Rhopalocera, taken by him in the Solomon Islands during the visits to those islands of H.M.S. 'Espiegle' in 1882 and 1883. Amongst the specimens exhibited were species of *Euplœa*, *Mycalopsis*, *Messarus*, *Rhinopalpa*, *Cyrestis*, *Diadema*, *Parthenos*, *Lampides*, *Sithon*, *Pieris*, *Papilio*, &c. Mr. E. B. Poulton exhibited a large and hairy lepidopterous

larva—apparently of a Bombyx—brought from Celebes by Dr. Hickson, and made remarks on the urticating properties of the hairs of the species, which were said by the natives to produce symptoms similar to those of erysipelas if the larva was handled. Lord Walsingham, Mr. M'Lachlan, Dr. F. A. Dixey, Mr. Jenner Weir, Dr. Sharp, Mr. Slater, and Mr. Poulton took part in a discussion as to whether urtication was due to the mechanical action of the hairs in the skin, or to the presence of formic acid, or some other irritant poison in glands at the base of the hairs. There appeared to be no doubt that in some species the irritation caused by handling them was merely due to the mechanical action of the hairs. Mr. P. Crowley exhibited a collection of Lepidoptera recently received from West Africa, including specimens of several new or undescribed species of *Mylothris*, *Diadema*, *Harma*, *Rhomaleosoma*, &c. Mr. H. Goss reported the capture by Mr. G. D. Tait, at Oporto, in September last, of a specimen of *Anosia plexippus*, and remarked that, although some twenty specimens had been caught in the South of England, only two specimens had been previously recorded from the continent of Europe. Lord Walsingham read a paper entitled "A Revision of the genera *Acrolophus* (Poey) and *Anaphora* (Clem.)"; and he exhibited about twenty new species of these and allied genera. Mr. Stainton made some remarks on the genus *Anaphora*, and said he was glad Lord Walsingham was working at it and its allies. The paper was further discussed by Mr. M'Lachlan, Mr. Champion, and Dr. Sharp. Mr. Poulton read "Notes in 1886 on Lepidopterous Larvæ, &c." In the discussion which ensued, Lord Walsingham referred at some length to instances of protective resemblance in larvæ, and alluded to the existence in certain species, especially of the genus *Melitæa*, of prothoracic glands. Further instances of protective resemblance were cited by Mr. Jenner Weir. Dr. F. A. Dixey remarked on the extraordinary powers of contraction which appeared to be possessed by the retractor muscle of the flagellum in *D. vinula*, and enquired whether any corresponding peculiarities of minute structure had been observed in it. The discussion was continued by Mr. Gervase Mathew, Mr. W. White, Dr. Sharp, Mr. Porritt, and others.—H. Goss, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—March 24th, 1887. R. Adkin, Esq., F.E.S., President,

in the chair. Messrs. J. Stringer and J. W. Slater were elected members. Mr. J. A. Cooper exhibited a variety of *Cidaria immanata*, Haw., from North Devon. Mr. Carrington remarked that this form was found not uncommonly in the mountains of Scotland, and he believed the larvæ fed on bilberry. Mr. Cooper also showed a specimen of an ichneumon bred from a pupa of *Sesia sphegiformis*, Fb. Mr. T. R. Billups exhibited *Stilpnus deplanatus*, Gr., bred from the larva-case of a species of *Psyche* found on a fence in his garden at Peckham; also *Apanteles tetricus*, Reinh., bred from the common thrift (*Armeria maritima*, Auct.) found in the Warren, Folkestone. Mr. Billups stated that this rare species of Braconidæ had hitherto only been recorded from Devonshire. At the close of the ordinary business there was an exhibition of microscopical objects, Mr. Tutt showing wings of Lepidoptera prepared and mounted by Mr. Coverdale and himself. Mr. W. West, of Streatham, eyes of spider and other entomological subjects. Mr. Dadswell, botanical objects. Mr. Macer, *Vespa vulgaris*, &c. Mr. Medland, proboscis of blow-fly, &c. Also an adoption of the electric light for microscopical and surgical purposes.

April 14th, 1887. The President in the chair. Mr. J. A. Cooper exhibited *Amphidasys strataria*, Hufn. Mr. C. A. Briggs, a large number of *Lycæna bellargus*, Rott., including many forms both of the male and the female, dwarfed forms, and some remarkable varieties of the under side; also another box containing a pale yellow form of *L. ægon*, Schiff., and varieties of the under side of *L. icarus*, Rott., and *L. astrarche*, Bgstr. Mr. Goldthwaite, living larvæ of *Pericallia syringaria*, L. Mr. R. Adkin, pupa-cases of *Eupæcilia ambiguella*, Hb., from the New Forest. Mr. T. R. Billups, fine specimens of the following Coleoptera: *Megalosoma typhon*, from Chili; *Xylotrupes gideon*, from the West Indies; *X. dichitonus*, from the Phillipine Isles; *Golofa centaurea*, from W. Africa; *G. hastatus*, from Mexico; and *G. alacus*, from Columbia; also three examples of the rare Lamellicorn, *Phœneus imperator*, Fab., from Chili; and contributed some interesting remarks on his exhibit. The Secretary read a letter from Mr. W. F. de V. Kane, referring to the capture by a friend of a sound-producing lepidopteron in the Gerallhpur Woods, India. Mr. T. D. A. Cockerell contributed a paper "On Variation."—H. W. BARKER, Hon. Sec.

REVIEWS.

British Pyralides, including the Pterophoridae. By JOHN HENRY LEECH, F.L.S., F.Z.S., &c. London: R. H. Porter, Tenterden Street. 1886. Cr. 8vo, 18 coloured plates.

IN his introduction Mr. Leech says, "The object of this treatise is to set before the student an illustrated list of the British examples of the group"; and we may add that such a work was greatly needed. It is something more than a mere list, for, although there is little pretension of original work on the part of the compiler, he has furnished us with pretty well all the published information up to the date of issue, collected from the current literature of his subject, especially with regard to descriptions of larvæ and localities of occurrence. The larval portion will be most useful to those studying the natural history of these moths, for it has been hitherto troublesome to hunt up any particular account from magazines extending over a long series of years.

Mr. Leech avoids all descriptions of the imagines, leaving the differential details to be gathered from the plates. This is rather a pity, for in nearly allied and variable species, as, for instance, in the genus *Scoparia*, a few words pointing out special characters and extremes of variation would have been most useful. If all species had been exactly like the individual specimen figured, identification by this illustrated list would have been easy enough; it is, however, otherwise, and hence the advantage of what we may hope will be added in a future edition. We do not quite understand the reason for the system adopted in choice of synonyms: would it not have been well to have used all if any?

In a prefatory note Mr. Leech advocates the flat system of setting in preference to the style usually adopted in this country. In these remarks we quite concur.

The plates are generally good, but there seems to be a slight want of sharpness in colouring, giving the idea in some instances of the figures having been taken from faded specimens. They are, however, sufficiently good for all ordinary identification.

The work cannot be described as a literary effort on the part of Mr. Leech, though it will be none the less useful in con-

sequence to those for whom it was intended. We trust, however, now that he has once "appeared in print," its compiler will use his exceptional opportunities to give the entomological world some of the results of his original investigations.—J. T. C.

Report of Observations of Injurious Insects and Common Farm Pests during the year 1886, with Method of Prevention and Remedy. Tenth Report. By ELEANOR A. ORMEROD. London: Simpkin, Marshall & Co. 1887.

MISS ORMEROD'S annual reports on injurious insects continue to increase both in size and interest. This tenth report, for the year 1886, runs to 112 royal 8vo pages, together with six pages of preface; and, as usual, is fully illustrated. Naturally the chief interest is centred in the full notice of the Hessian Fly (*Cecidomyia destructor*) and its attack in this country, recorded from such distant localities as Essex, Herts and Beds, Inverness and Perthshire. This occupies nearly seventeen pages, and is full of interesting and important detail, as might be expected from the painstaking author.

Other special reports are made on the "Tulip-root" disease of oats, probably due to a species of Anguillulidæ (nematode worms), similar to that causing cockle in wheat; and we can only hope that, now such detailed notice has been called to this pest, it may enable our agriculturists, especially in Scotland, where the disease seems prevalent, to assist Miss Ormerod in arriving at a fair knowledge of this apparently destructive pest during the present year. The Mustard Beetle (*Phædon betulæ*), whose attacks during the last two years have almost entirely stopped the cultivation of white mustard in my own district of Essex; Warbles (Æstridæ); and many other better-known insect enemies are fully reported upon; and the information gained and so faithfully recorded should prove of value to all practical men, as well as of interest to all entomologists; and their gratitude must be expressed to Miss Ormerod's continued and self-denying efforts in supplying a want which has been so long felt in this country.—E. A. F.

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LOCALITIES FOR BEGINNERS.

By JOHN T. CARRINGTON, F.L.S.

NO. XI.—THAMES SALT-MARSHES.

THE most convenient route for the collecting-ground near the mouth of the River Thames is by the London, Tilbury, and Southend Railway, from the London terminus in Fenchurch Street. The salt-marshes commence within twenty miles from London, but these are not quite so prolific, nor so accessible, as those somewhat farther down the line. A convenient station on the railway is Benfleet, which is close by the fine marsh skirting the creek which surrounds Canvey Island on the north side. On arrival at Benfleet we leave the station, and, instead of going into the small village, we turn eastwards for a few yards, when the road becomes, if it be low-water, a ford over the creek; but, if it be high-water, there is a ferry-boat in attendance.

Crossing the creek, we follow the high road for a little way, and see on either side of us two distinct types of salt-marsh; that on the right is by no means favourable for collecting insects, being too wet or boggy for comfort in walking, so we will leave it without further exploration. The plants most numerous represented are a *Chenopodium* and the salt-marsh samphire, each in luxuriant profusion. Continuing up the road there stands on the left-hand side a farmhouse, but before reaching it a little pond within the sea-wall. Passing this pond we keep under the sea-wall along the side of the marsh for about half a mile, until we find the grassy portion of the marsh quite firm

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and fairly-dry. Then it is that we may commence work, which is most successfully conducted during the afternoon, and on until dusk on fine sunny afternoons from May until September. This drier portion of the marsh reaches for a couple of miles along the sea-wall towards the village of Leigh, beyond the ruined towers of ancient Hadleigh Castle, which rise on the hill-side to the left.

The flora surrounding us is now quite characteristic of the locality. Sea-lavender (*Statice limonium*) the handsome *Aster tripolium*, sea-wormwood (*Artemisia maritima*), and many others are closely growing in patches and in profusion, each forming the pabulum of some equally characteristically local lepidopteron.

Macro-Lepidoptera by day are decidedly scarce on salt-marshes, but the Micro-lepidopterologist will be well repaid for his afternoon's work. Among the sea-lavender the local plume moth, *Agdistis bennetii*, will be found from time to time during the afternoon, though just before dusk it appears in sufficient numbers to keep the collector busy with his net and boxes. These moths appear in June and August, while the larvæ may be found at night feeding on the leaves of sea-lavender. Few can be discovered in the day-time, though the plants having notched and riddled leaves should be searched for the curious little sphinx-like larva of this moth; but where one can be found by day many may be found by the aid of a light at night. Mr. South, in his admirable "Contributions to the History of the British Pterophori" (Entom. xvi. 27), describes and figures this larva, also a leaf of its food-plant, showing the curious mode of marking the leaf where they have been feeding.

Several species of Tortrices peculiar to salt-marshes abound in their seasons, *Eupœcilia affinitana* and *E. vectisana* especially so, apparently all over the marsh. It requires only a gleam of afternoon sunshine to make these species flit about in abundance in June and July. By disturbing the *Artemisia*, *Catoptria candidulana* may be found, particularly where the plants grow on the marsh rather than by the sea-wall adjoining. The same plant should be examined in autumn and spring for the curious larvæ of the once very rare *Phorodesma smaragdaria*, which has recently become an example of the fallacy of rarities among Lepidoptera. Once its habits became understood it was found upon the very ground where we had been diligently working for

years. It is by no means common now, and requires patient attention to find and rear this beautiful insect.

I have never sugared in this locality, but have occasionally found odd noctuoids at rest, or started them from the herbage. Perhaps the best of these was *Mamestra abjecta*, which would not be uncommon at sugar. There is not much upon which the bait could be spread with satisfaction, and we should have to be very careful not to get bogged in the darkness.

One of the prizes of this inhospitable district is the rare little *Psyche*, *Epichnopteryx reticella*, a most difficult insect to find. It flies only in the brightest sunshine, and may easily be mistaken for a gnat, so small and obscure is it. When the knack of seeing these mites is once acquired a nice little series may be obtained.

Such are some of the moths frequenting salt-marshes. There are many others, including *Bombyx castrensis*, but it is not likely we shall visit the locality for pleasure, though many an interesting afternoon may be spent in summer in hunting over a salt-marsh for imagines, or in autumn for larvæ. Then we must give attention to the stems of the aster plants, and find therein larvæ of one of the two *Eupaciliæ* just mentioned. I never worked the flowers of this plant at night, but they look very suggestive as an attraction for moths.

I will now indicate other similar localities, for although Benfleet is typical it is by no means one of the best. There are several nearer Thames Haven; Stanford-le-Hope is the best station, though some distance off. Farther down there is a good salt-marsh to the north of Shoeburyness, about half an hour's walk from the railway station, when we pass the sand-hills on the way, and may pick up other species than those peculiar to the locality described. In this marsh, which is not actually by the side of the Thames, but skirts the German Ocean, the sea-lavender is more abundant than at Benfleet. Here, too, the little *Psyche* has occurred in late years more plentifully than at Benfleet; the latter locality is much more rich in luxuriant beds of asters. Another fine marsh is to be reached by omnibus, which runs in connection with certain trains from Southend Station to Cricksey Ferry, which is on the River Crouch, near Burnham. Near the inn at Cricksey there are immense beds of *Statice*, the lavender flowers quite tinting the landscape as we

look over the otherwise barren scene. This is a very inhospitable district, and not easily worked, unless we stay in the quaint little town of Burnham, which is on the wrong side of the river.

On the south side of the Thames the first salt-marshes of consequence appear after passing Gravesend; the collecting there is apparently not so good as on the other side of the river, but still farther east are others in the Hundred of Hoo, and skirting both sides of the River Medway as far as and a little beyond the ancient city of Rochester, which are most extensive and characteristic. The marshes of the latter river are easily reached from Sheerness on the one side and Port Victoria on the other by South Eastern Railway. This series of marshes extends almost round the southern and western sides of the Island of Sheppy.

A phenomenon to be observed at high spring tides has frequently puzzled me, and given rise to much speculation while hunting for insects on salt-marshes, *viz.*, the fact that frequently the tide completely overflows the marshes, and for an hour or two turns our hunting-ground into an arm of the sea, with multitudes of rippling wavelets instead of our coveted collecting-ground. During this period there is not a sign of an insect flying over the water. As the tide recedes, and little islands of the taller plants appear through the water, we notice the first indication of moths appearing. When the water has left the marsh we examine the wet and sloppy ground, and find multitudes of delicate Tortrices and plumes in perfect condition, flitting about as though nothing had happened to disturb their comfort. Now, where were these moths when the tide covered the marsh some two or three feet deep? One can hardly imagine they were under the water all the time, though there was not a sign of them over it. Many times have I watched this rising and falling of the tide, but never solved the problem.

It is comparatively useless to visit these localities in windy or cloudy weather. Fine sunny afternoons are best, unless we go in for night-work, which I never had opportunity of trying; but under favourable conditions I should imagine that it would repay our labours with local additions to our collections. Salt-marshes are at best but dreary and weird, and far from picturesque. I have still a vivid recollection of staying until *after dusk* one autumn evening in one of these localities, when

a steady, heavy rain set in. A more depressing and melancholy scene could be imagined with difficulty. The only relief from the sound of the pattering rain was an occasional plaintive cry of plover or redwing disturbed by our presence.

Westminster, May, 1887.

NOTES ON THE NOTODONTIDÆ.

BY THE REV. BERNARD SMITH.

(Continued from p. 93.)

I may now proceed to the other maple prominent, *Lophopteryx cuculla*, whose history contrasts in many points with that of *Ptilophora plumigera*. If the latter likes the sun, the former emphatically prefers the deepest shade. If one comes out in a burst, the other continues coming out for more than a month. *Plumigera* may be seen in the perfect state at light; but *cuculla* is seldom seen, except in the breeding-cage.

I found the eggs of *cuculla* about 1856, in the same summer as the late Rev. H. Crewe, and in greater numbers, because I found them at the right time, viz., the middle of July. The egg and young larva must be searched for on chalky hill-sides sloping to the north, in the densest shades of beech woods, on stunted maple bushes, and often within a few inches of the ground. A likely bush for the larva may be known by the blotches on the leaves, caused by the larva having eaten, when young, the under surface of the leaf.

The egg is greenish white at first; afterwards opalescent, showing the head of the larva through the transparent shell. An egg found in this stage is of more value, and a young larva is still more sure to do well. Eggs laid on green leaves are difficult to manage when the leaves dry up. They are better left till near the time of hatching. There are two varieties of this larva,—the brown or flesh-coloured, and the whity-green. The green is scarcer, and does not produce the female, as sometimes asserted. The single red hump at the tail at once distinguishes even the green variety from *Lophopteryx camelina*. Whether the larva feeds up quickly depends on the warmth of the season; but I have never known it to be double-brooded, though an odd one has emerged in the autumn.

When full-fed some large fresh leaves of sycamore or lime may be laid on the surface of the earth in the cage, and the larva will spin up, just under or between the leaves, in a soft cocoon. The pupa should be kept dry, and is easy to manage.

This insect is well reared on sycamore, the large leaves of which give the needful shade. Though not very cannibal in its habits, large larvæ should be kept separate from small ones, which are otherwise apt to disappear.

The range of *cuculla* seems wider than that of *plumigera*. I have taken it on the chalk in South Bucks, Oxfordshire, and Berkshire; and known of its being taken, though more rarely, in Essex and Devonshire. It is more difficult to pair in confinement than *plumigera*; and the young larvæ are apt not to take to their food. Cloudy showery weather, however, and trees planted in the shade, partially overcome this difficulty.

There is a light variety of the imago, but the darker specimens are preferred by the collector; and the female sometimes attains a large size, if slowly grown on succulent leaves of the young sycamore. A larva of such exceptional size has been figured by the late Mr. Buckler, in his 'Larvæ of British Moths.' The larva of this moth is often stung, but its chief enemies seem to be the spiders, which will attack the egg and the young larva without mercy.

Fortunately neither of the maple prominents is inclined to grease; and no insect is more easy to set well than *L. cuculla*, and the specimens dry quickly and keep their form admirably.

Marlow, Bucks, May, 1887.

A CODE OF VARIETAL NOMENCLATURE.

By T. D. A. COCKERELL.

It has been generally recognised, by those who have studied the subject, that some form of nomenclature is advisable for application to varietal forms, just as it is universally applied to species and genera. A variety, therefore, is distinguished in nomenclature by a third or varietal name following the specific one;* and, as far as we have at present advanced, all the

* The letter "v." or "var.", indicating it to be a variety, is usually inserted between the varietal and specific names; but this is by no means necessary, and is not used by all naturalists.

ordinary rules for specific names have been held equally admissible for varietal ones. Thus we have *Triphæna orbona curtisii*, named after an individual; *Thera juniperata scotica*, after the country it inhabits; *Mamestra persicariæ unicolor*, having reference to the colour; and so on.

Considering this, and considering the nature and relations of varieties, it seems to me that while we are yet comparatively early in the history of the science, and the vast majority of varietal forms remain as yet unclassified, it is extremely necessary to make all possible arrangements for the simplification of the nomenclature. Of course to those who are studying a group in detail, and know well every varietal form within its limits, it will matter little what names they use, since one name is as good as another (if grammatical, and easy to pronounce and write), after once it has been fixed in the mind and associated with a certain known object. But when it is remembered how many species there are, and how each one will probably have at least one variety differing from the type, and variable species very many, it is quite clear that any but the strictest specialists will experience considerable difficulty in remembering the characters of named varieties, which difficulty would be greatly lessened if the names themselves were so contrived as to indicate the nature of the variation. This is, indeed, done in many cases; but what I wish now to propose is this:—That in all cases in which the *same* kind of variation is common to two or more species, some name shall be adopted which shall be used to distinguish the variety in whatever species it may occur, and shall, as far as possible, express the character of the variation; except when some other name has been proposed, in which case the rules of priority could not well be infringed.*

Example.—The red pigment of several species of moths, such as *Zygæna*, has a tendency to become altered to yellow, either by some change in the arrangement of its molecules, or by its splitting into a simpler compound. This change, whenever it occurs, may be expressed by the name "*lutescens*." For examples:—

Zygæna filipendulæ lutescens. Entom., 1879, 225; Ent. Mo. Mag., 1877, 67.

* Unless some international committee were appointed, by the common consent of entomologists, to deal with such matters; and I hope that some day this may be done.

Z. trifolii lutescens. Entom., 1878, 102.

Chærocampa porcellus lutescens. Entom., 1878, 169, and fig.

Calligenia miniata lutescens. Ent. Mo. Mag., 1879, 110.

Sesia culiciformis lutescens. Entom., 1878, 102.

Arctia caia lutescens. Entom., 1887 (S. Lond. Ent. Soc.).

Callimorpha hera lutescens, Stgr. Proc. S. Lond. Ent. Soc., 1885, 20.

C. dominula rossica, Kol. Staud. Cat., 1871.

Doubtless many other cases will occur to anyone, in which the same method might be adopted; for instance, *deletus* may be used for complete, and *subdeletus* for partial, suppression of spots or banding; *pallescens* for pale forms, such as are found in the Satyridæ; *suffusus*, *obscurus*, *nigrescens*, and *niger* for different degrees of suffusion or of melanism; *major* and *minor* for large and small forms, say one-third or more larger or smaller than the type.

Bedford Park, Chiswick, May, 1887.

[We insert Mr. Cockerell's suggestions without necessarily endorsing them. The trinomial system has some objections; but the subject is well worthy of discussion, and will doubtless receive the attention it deserves from our readers.—Ed.]

NOTES ON SILK-PRODUCING BOMBYCES—1885.

BY ALFRED WAILLY.

(Membre-Lauréat de la Société d'Acclimatation de France.)

(Continued from p. 131.)

Antheræa pernyi, Guérin-Méneville. The Chinese Oak Silk-worm.—Moths emerged from cocoons from the 24th of April till about the end of June, a very unusual thing. In May, which is the ordinary month for the moths to emerge in northern countries, very few moths emerged in consequence of cold weather; it was the same with respect to some other species. Eggs of *pernyi*, received from Spain on the 22nd of April, hatched on the 20th of May. The rearings took place in the garden, and the larvæ, together with those of the hybrid *roylei-pernyi*, had the same fate as those of *yama-mai*.

I mentioned in my report for the year 1884 that a hybrid had

been obtained in Spain, by the crossing of *mylitta* male with *pernyi* female, and thirty cocoons of this hybrid were sent to me, the moths of which emerged from the 1st of May till the 6th of June. I did not notice any difference in the cocoons and moths of this hybrid from those of *pernyi*. I obtained six pairings, the last two being during the night of the 6th and 7th of June. The first moth, emerged on the 1st of May, was a male; the second, also a male, emerged on May 24th; from the 26th May to the 6th of June all the rest were out. Before the moths had commenced to emerge regularly, I had received a large quantity of eggs of this hybrid on the 8th of May, from my correspondent in Spain. These eggs commenced to hatch, like those of *pernyi*, on the 20th of May. The larvæ looked like those of *pernyi*, but a certain number were very peculiar, and if such differences occur with some larvæ of *pernyi*, I have not, as yet, noticed them. After the first moult, however, all the larvæ were alike. Those larvæ which differed from the others were ash-grey, which changed into a buff colour as they grew larger, and they were covered with long white hairs; the tubercles were black. In second stage, being all alike, they were emerald-green, covered with small white dots; tubercles, fine orange-yellow and black hairs; head brown. No further notes were taken. My impression has always been that a mistake was made with respect to the production of this hybrid *mylitta-pernyi*; and that although the pairing of these two different species seemed to have taken place, it had, in fact, not taken place. My correspondent, however, wrote to me a long letter, in which he asserted that the person who had the care of the silkworms was a very careful man, and that he had not made any mistake.

Antheræa mylitta, Fabricius.—This very important Indian wild silkworm has been reared in Europe by many entomologists on oak, and by some on hornbeam, *Carpinus betulus*. In 1885 one of my correspondents, who reared successfully several species, informed me that *mylitta* larvæ thrive well on plum. The cocoons, of which I had a very large quantity in 1885, commenced to hatch on the 8th of June, one moth however having emerged on the 12th of May. The moths continued to emerge till the 22nd of October. Four pairings only took place: the first, in early morning of the 6th of July, in open air; the second, in the house on the 7th of July, at 12.30 in the night;

the third, in the morning of the 13th of July; the fourth pairing took place on the 26th of July at 8.30 in the evening, and lasted twenty-four hours—286 were obtained from this last pairing. The eggs were sent to various correspondents, but no communications were sent to me respecting the result of the rearings.

Actias luna, Linn.—With twenty-one cocoons of this species, the moths of which emerged from the 6th of June to the 21st of June, only one pairing was obtained on the 12th of June, and the female died without laying any eggs. The moths, though small, were for the most part perfect. On the 10th of June there were five couples which were all placed in the open air in the garden, but no success was obtained, the weather being very unfavourable.

On the 3rd of July I received from my correspondent in Brooklyn a box of eggs, which hatched on the day of their arrival. Two other boxes I received on the 5th, but the larvæ had hatched and died in transit. On the 7th a larger box came, the larvæ hatching well, and there were about 400 in splendid condition nearly all hatched on the day the box arrived. I bred some of these larvæ on walnut, others on plum. The larvæ feeding on walnut grew rapidly, those on plum very slowly. Although *Actias luna* is very polyphagous in America, here it seems to thrive best on walnut. I discontinued the rearing of this and several other species at the end of July, shortly before my departure for Paris, when I entrusted the remaining larvæ and cocoons to a friend.

During my absence five or six little boxes of *luna* cocoons were sent to me from Brooklyn. With the exception of a few, all the cocoons hatched during the month of August, the moths pairing readily with the warm weather. Thousands of fertile ova were sent to me to Paris. These were distributed among several members of the Société d'Acclimatation and entomologists in various parts, but none of them, as far as I have been informed, succeeded in rearing the larvæ till the formation of the cocoons, the foliage having failed before that time. On my return to Norbiton, on the 1st of September, I found a box of *luna* ova received the day before I arrived at home, but the larvæ had nearly all hatched, and the few which were still alive soon died. On the 4th of September two more boxes of eggs arrived, and the larvæ of these hatched remarkably well. Several entomolo-

gists tried to rear them, but, like myself, they all failed ; it was too late to rear these worms of the second generation, through want of proper foliage. My own larvæ lived in good condition till about the end of October, but from that time they began to die, the last one dying on the 21st of November. A great deal of trouble and expense had been incurred by me to arrive at a satisfactory result, but all in vain. The room where the larvæ were reared was heated, first with a large paraffin lamp, and afterwards with a stove, but I could only give them some old walnut leaves. I had collected a large quantity of these old leaves, which were kept in an air-tight iron box. I also tried other kinds of foliage. The last walnut-tree leaves had been touched by the frost, and the larvæ refused to eat them, and every other kind of foliage.

Of other species little can be said. Only three moths emerged from about fifty cocoons of *Cricula trifenestrata*, from Madras, which were all in very good condition, but the cold weather in May and June was fatal to them. It was the same with respect to *Attacus atlas* cocoons, which died through want of sufficient heat for the moths to emerge.

By means of the gas-stove (a stove which does not emit any smell) which I have had fitted in one of the rooms where I keep cocoons and rear larvæ, I intend in future to keep the cocoons at a warm and even temperature from the month of April, till all the moths have emerged and the eggs hatched. I hope thus to prevent all these losses.

Platysamia cecropia and *Callosamia promethea*, from North America, were a complete failure, a very unusual thing, but the number of cocoons I had of these species in 1885 was very small.

Attacus cynthia, the Ailanthus silkworm, was as usual very successful. The moths commenced to emerge on the 5th of July and nineteen pairings were obtained, the last having taken place on the 4th of August. Some of the cocoons were of my own rearing in the open air on lilac trees in my garden ; the others had been sent to me from America, where the species is now well acclimatised.

Mr. C. G. Flemwell, one of my London correspondents, who successfully bred various species of silk producers, and obtained a number of cocoons of *A. pernyi*, *roylei-pernyi*, hybrid, *Actias*

luna, *Attacus cynthia*, &c., kindly sent me a diary of his notes, which, commencing on the 20th of May and ending on the 5th of September, give an interesting and full account of the result obtained with the various species. He concludes by stating that he could not rear *mylitta* (the larvæ of which hatched on the 5th of September), nor any of the larvæ of the second broods, for want of food.

Tudor Villa, Norbiton, Surrey, March, 1887.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

VANESSA ANTIOPA WITH YELLOW BORDERS.—I am unable to gather whether Mr. S. J. Capper (Entom. 135) means that his British *V. antiopa* have white borders, or that English *V. antiopa* generally have, though his have not. I am in a position to state that three undoubtedly British specimens in my collection have borders that are quite as yellow as three continental (bred) insects that I have placed beside them for comparison. His friend M. Wurzburger's statements (1), "that no larvæ have been found in England," and (2) "that specimens captured in England are always hybernated specimens," might of course be checked by looking up the literature of previous years on the subject. But I must give a most emphatic denial to the other two statements in his letter (1), "that the English-caught specimens *always* have white borders," and (2) "that the wings are always more or less broken." My specimens (which were exhibited at the last Annual Meeting of the South London Entomological Society) can be brought forward to prove these last two points. It appears to me that the state of the fringes of an insect's wings is the most important evidence that it is a recent specimen, and has not flown much. The fading of the yellow border to white may occur; but I have not yet come across anyone who seemed to consider it a point of importance, as regards nationality.—PERCY RENDALL; 16, Little Grosvenor Street, W., May 3, 1887.

VANESSA ANTIOPA LARVÆ IN ENGLAND.—The gentleman who stated in his letter (Entom. 135) that *V. antiopa* was *never* found in England in the caterpillar stage is, I am afraid, wrong. I have an *imago* bred from one of twenty-seven larvæ found on a

willow, and of course with the yellow border. No doubt there are many other such instances. As the person who sent it gave it without even being asked, he would have no object in deceiving me. I have often noticed these white-bordered specimens of *V. antiopa* abroad, and they are never, so far as my experience goes, in very good condition.—K. DINGWALL; Knollys Croft, Leigham Court Road, Streatham, S.W.

DEILEPHILA LIVORNICA IN FEBRUARY.—On the 18th of April last an old servant, living with her father at Coles Cross, near Crewkerne, sent me a specimen of *Deilephila livornica*, which flew into their cottage (attracted by the light) in the beginning of February last. She states that they caught one last year, and that a neighbour took one the previous year, about the same date.—J. A. HELPS; Newstead Lodge, Westhall Road, Forest Hill, S.E., May 3, 1887.

HYBERNAL EMERGENCE OF MACROGLOSSA STELLATARUM.—On going, Dec. 11th, for the purpose of damping a breeding-cage, I was surprised to find a freshly-emerged specimen of *Macroglossa stellatarum*. Is not this an undue emergence? The caterpillar I found in September, and it turned to the pupa state at the end of that month. I have always been under the impression that Newman's statement of the appearance of this insect from January to December referred to hibernating specimens. The breeding-cage has been kept in a room, but without fire, and the temperature has only been just above 50° for some time, so there has been no forcing.—T. B. JEFFERYS; Clevedon.

PLUSIA NI IN DORSET.—My attention has been called to a note (Entom. 138), headed "*Plusia ni* in Hampshire," by Mr. Bankes, of Corfe Castle. He wishes me to state that it was caught in Dorset, some miles to the west of Bournemouth.—E. B. NEVINSON; 2, Elm Villas, Elm Row, Hampstead.

CROCALLIS ELINGUARIA, HATCHING OF OVA.—In reply to Mr. W. E. Butler (Entom. 138), I think I may say that the eggs of *C. elinguaris* invariably hatch in April, and that the larvæ never hibernate.—OWEN S. WILSON; Carmarthen.

CROCALLIS ELINGUARIA, HATCHING OF OVA.—Rössler, in his 'List of the Lepidoptera of Nassau,' says that *Crocallis elinguaris* hibernates in the egg state. This is undoubtedly correct, and agrees with my own experience. In August, 1878, I found some

eggs of this species. The first one hatched on the following 16th of February, and the last 7th of March. The larvæ then fed up well, and one moth emerged 29th June, which is an early date for this species.—ALFRED SICH; Burlington Lane, Chiswick.

LARVÆ OF *CROCALLIS ELINGUARIA*.—Referring to Mr. Butler's note on *Crocallis elinguaris* (Entom. 138), I have often bred the moth, but without the larva hybernating; and this agrees with the time given in Stainton's Manual for the appearance of the larva, viz., April and May. Whether the larva generally hybernates in the ovum I am unable to say. So far as I have had experience the ova are laid about the end of August or early in September, and do not hatch until the following March, sometimes so early in the month that it is difficult to obtain hawthorn (*Cratægus oxyacantha*) sufficiently advanced on which to feed the young larvæ. Last season I tried to rear *elinguaris* on that pretty and familiar variety of thorn, the red May of our pleasure gardens, but without success. I cannot account for my failure, and would like to know whether others have tried this food-plant and succeeded with it. With regard to the statement in Newman's work on 'British Moths,' that "it lives throughout the winter in the larva state about half-grown," I remember collecting a nearly full-grown larva in early spring some five or six years since, which I should say could not have arrived at that state of maturity without hybernating. More evidence, however, is desirable before hazarding a definite opinion on the subject. Yet the rule would appear to be that the larva does not hybernate; and it is for consideration whether any exceptional case might not be accounted for by hybernation taking place under abnormal conditions, such as premature appearance of the perfect insect favoured by an exceptionally warm and prolonged autumn.—GEO. J. GRAPES; 2, Buckleigh Road, Streatham Common, S.W.

[Mr. E. Holton (Entom. ix. 88) states that in the early part of August, 1875, he captured a female *Crocallis elinguaris*, which deposited a batch of ova. Two larvæ hatched, March 4th, 1876, and the other eggs showed signs of "approaching fertility." On page 141 of the same volume, Mr. G. T. Porritt says that he "never knew an instance of this species hybernating in any other than the egg-state"; and Mr. T. H. Hedworth confirms Mr. Holton's experience, and adds, "I have bred the species for

four years from eggs deposited by captured females. I have invariably found them hibernate in that state, and commence hatching the last week in February."—R. S.]

PERIDEA TREPIDA IN ESSEX.—On May 16th I found two fine specimens, male and female, of *P. trepida*, on an oak trunk, near Brentwood. The female has laid over 300 eggs. Is it usual for members of the family Notodontidæ to lay so large a number of eggs?—R. G. WILLIMENT; Hon. Sec., Field Club, Brentwood.

TEPHROSIA CREPUSCULARIA.—The following notes concerning *Tephrosia crepuscularia* in this district during the present season may be of interest, although so much has been previously written in the 'Entomologist' on the subject. From the backward spring I did not observe any specimens until March 26th. I have usually seen them early in the month. On April 12th, amongst many specimens observed, I saw three, with the ground colour white. One of these, a female, apparently just emerged, I brought home, and placed with a brown-coloured male. I believe they copulated; however, this female deposited eggs, which have since proved fertile. The eggs were found laid in crevices of the breeding-box on April 25th; and another specimen, obtained by a friend and placed under a bell-glass, laid eggs underneath a piece of bark. It appears evidently from this that in the natural state the eggs are concealed under the bark of trees, as far as possible. The young larvæ commenced to hatch out on May 13th. I tried Scotch fir and larch, pear, and plum for their food, neither of which appeared to satisfy them. I then placed blackthorn, on which they immediately commenced to feed readily, although they appeared inclined somewhat to the larch. Here I find the imago chiefly in fir plantations, and have unearthed the pupæ at the foot of larch trees, so that it appears somewhat strange the larvæ not taking readily to the larch. When hatched the young larvæ were all of deep black colour, with white divisions of the segments. The first to appear, however, have already changed in colour, being now brown, with white divisions of the segments. They appear to be feeding up rapidly.—T. B. JEFFERYS; Clevedon, May 19.

EUPECILIA UDANA.—Is this insect really double-brooded? I am induced to ask this question from having been repeatedly told by entomologists that there are two broods in the year, the

imagines of the first emerging at the end of May and beginning of June, and the second in August. In January last year I collected a bundle of the flower-stems of *Alisma plantago*, in which larvæ of *E. udana* were then feeding, and stood them in my garden till about the middle of May, when I removed them to a large cage. The moths began to emerge in June, and continued to come out freely for a period of at least two months, during which I bred over a hundred specimens, six being taken from the cage on 7th August, and one or two stragglers after that date. I believe the larvæ feed only in the flower-stems of *Alisma plantago*, and these are not sufficiently advanced to nourish the larvæ of a second brood to appear in August. I am inclined to think there is but one brood, but would like to hear the opinions of others on the subject. Last year, owing to the backwardness of the season, the moths were two or three weeks later in appearance than usual.—WILLIAM MACHIN; 29, Carlton Road, Carlton Square, E.

NOTES FROM HEREFORDSHIRE.—Two well-sheltered *sallow* trees produced an enormous quantity of the genus *Taniocampa* during Easter week, viz., *T. stabilis*, *T. incerta (instabilis)*, *T. gothica*, *T. pulverulenta (cruda)*. Not quite so common were *T. gracilis*, *T. munda*, *Pachnobia leucographa*, and *P. rubricosa*. There also appeared freely *Scopelosoma satellitia* and *Cerastis vaccinii*, and one *Xylocampa areola (lithoriza)*. A row of trees sugared (not 200 yards away from the *sallow*) produced *C. vaccinii* in swarms, and occasional specimens of *S. satellitia* and *T. munda*; the proximity of the sugar to the *sallow* trees is worth noticing. *Anticlea badiata* was the only Geometer that was to be found at the *sallow*. Two specimens of *Amphidasys strataria (prodromaria)*, reared from pupæ, emerged early in the month.—JOHN LEA; 2, Elm Villas, Elm Row, Hampstead, April 18, 1887.

THE HEMP AGRIMONY AND LEPIDOPTERA.—It is well known that all the Umbelliferæ are very attractive to insects, and particularly to Lepidoptera; but it is probable that none exceed in attractiveness the flowers of the hemp agrimony (*Eupatorium cannabinum*). In the Forest of Dean (in Gloucestershire) and also in the Forest of Wyre (in North-west Worcestershire) I have found this plant growing in great luxuriance, where also I have observed that it is an excellent resort of the Lepidoptera. On many occasions I have seen at least twenty butterflies, of var-

species, so busily engaged disporting themselves on the honey that they could be easily captured with the fingers. Towards the latter end of last year, in the Forest of Dean, I well remember witnessing a glorious sight, for on one flower-head I counted nearly thirty butterflies all at once, and of these ten were *Vanessa io*. It was a sight which could not soon be forgotten. What has induced me to write this is that I wish to recommend the cultivation of the hemp agrimony (*Eupatorium cannabinum*) to all entomologists on account of the attraction it offers to insects. It is a tall plant, sometimes exceeding three feet in height. It grows principally in damp situations, preferring open spaces in woods in the vicinity of water. Its flowers, which are of a purplish hue, give off a rather sickly odour. When once seen it cannot easily be mistaken by anyone. It would, perhaps, be a good idea to sow the seeds of the plant everywhere in suitable localities, by the entomologist, near his hunting-grounds. He will be certain to reap a rich harvest with very little trouble. The plant used to occur in Sutton Park some years ago, but is, unfortunately, now extinct. Mr. J. E. Bagnall, our local leading botanist, informs me that it is found in several stations throughout the district. I think, however, that it must be very rare in the immediate neighbourhood of Birmingham, as I have never observed it growing there.—W. HARCOURT BATH; Ladywood, Birmingham, May 16, 1887.

THE BACKWARD SEASON.—On the 23rd of May I took a long walk, extending over about four hours, through sheltered woods in Hampshire. Although the sun shone brightly, and the air was warm in protected places, during the whole time I saw only *Pieris brassicæ*, one or two common hybernated *Vanessidæ*, and a single female *Diurnea fagella* among Lepidoptera. All other orders of insects were equally scarce. Spring flowers were in extraordinary abundance in the woods, there being in places perfect gardens of primroses, cowslips, oxlips, orchids, hyacinths, Solomon's-seal, germander-speedwell, tway-blade, and others in profusion. Not a sign was there of any spring butterflies beyond the common whites.—JOHN T. CARRINGTON; May 25, 1887.

BLENNOCAMPA ATTERIMA, *Klug*.—A female of this very rare species of Tenthredinidæ was taken by myself at Chobham in June last, clinging to the bloom of Solomon's-seal (*Polygonatum*).
ENTOM.—JUNE, 1887.

multiflorum), which was growing in profusion on the railway bank. This species has not, I think, been found since the time of Curtis, when a solitary specimen was taken at Putney by the present Earl of Ripon. Cameron gives as the food-plant of the larvæ, *Convallaria multiflora* and *C. polygonata*; and the continental range, Sweden, Holland, France, Germany, Italy, and Russia.—T. R. BILLUPS; 20, Swiss Villas, Coplestone Road, Peckham, S.E.

BLENNOCAMPA ALTERNIPES, *Klug.*—Another almost equally rare species of sawfly—first taken by myself at Loughton, Essex, in May, 1884, by sweeping, and described by Mr. Cameron in his 'Monograph of the British Phytophagous Hymenoptera,' vol. ii., p. 220—was again met with by myself in Headley Lane, in May last, on the plants of the wild raspberry, on which its larvæ feed. Cameron gives its continental distribution as Sweden, Germany, France.—T. R. BILLUPS.

HYDRŌUS PICEUS IN LONDON.—It may interest some of the readers of the 'Entomologist' to know that on the 30th June last I caught a fine specimen of this gigantic water-beetle, near St. Katherine's Docks, crawling on the pavement. Is not this a peculiar locality for such an insect?—A. J. FIELD; 359, Hornsey Road, Holloway, London, N.

CECIDOMYIA DESTRUCTOR.—The first imago of the spring brood of the Hessian Fly made its appearance a few days ago at Errol (Carse of Gowrie, Perth) amongst Mr. Taylor's isolated pupæ; this was sent to Miss Ormerod, and by her presented to Mr. Inchbald.—E. A. FITCH; Maldon, Essex, May 25, 1887.

PRACTICAL ENTOMOLOGY AT SOUTH KENSINGTON.—The Natural History branch of the British Museum in Cromwell Road has just received a most important donation from Lord Walsingham, consisting of a collection of Lepidoptera with their larvæ, mainly British butterflies (*Rhopalocera*) and certain families of moths (*Heterocera*), including *Sphingidæ*, *Bombyces*, *Pseudo-Bombyces*, *Noctuæ*, *Geometridæ*, and *Pyrilidæ*. There is also a fine series of Indian species, collected and preserved at Dharmasala, in the Punjab, by the Rev. John H. Hocking; and specimens of Exotic silk-producing *Bombyces*, in various stages of their development, obtained mostly from Mons. Wailly. With very few exceptions, the British larvæ, which retain a most life-like appearance, and are placed upon models of the plants upon

which they feed, have been prepared and mounted by Lord Walsingham himself; the process adopted having been inflation of the empty skin of the caterpillar by means of a glass-tube and India-rubber spray-blower over a spirit-lamp guarded by wire gauze. This has been found a simpler and quicker process, and one admitting of more satisfactory manipulation, than the alternative system of baking by means of heated metal plates or ovens. The specimens have mostly retained their natural colour; but in the case of the bright green species it has been found necessary to introduce a little artificial dry pigment. The whole collection consists of 2540 specimens of larvæ, belonging to 776 species, together with a series of the perfect insects of each species. As continued exposure to light is, unfortunately, most detrimental to the colours of insects, this exhibition cannot be exhibited permanently; but, for the advantage of those who would like to see it without any restriction, it will be placed in the entrance-hall of the Museum for a period of six weeks, from May 16th to June 25th, so as to include the Whitsuntide holidays and the Jubilee week.

There are altogether ninety-six cases, about seventy containing the British collection, which is a most interesting one, both as regards imagos and larvæ. There are ten imagos of the extinct *Noctua subrosea*. Amongst the larvæ will be found eight of *Nola confusalis* from the New Forest, and two of *N. strigula*; in the Sesiidæ there is the rare larva of the alder-feeding *S. spegiformis*; the Bombyces are remarkably well represented and very attractive, with the numerous specimens of their robust larvæ. There are six imagos and eight larvæ of *Pygæra anachoreta* from Sparham, Norfolk, taken by Mr. F. Norgate in 1880. Amongst the Noctuæ there is much to interest, especially in a relative comparison of the much-alike larvæ of *Leucania*, *Agrotis*, *Noctua*, *Teniocampa*, *Cucullia*, &c. There are three larvæ of *Acronycta strigosa*, one of *Acosmetia caliginosa*, eight of *Agrotis ashworthii*, five from Mr. Meek and three from Mrs. Hutchinson. The *Dianthæciæ* are very interesting and pretty; there are three larvæ of *D. cæsia* and seven of *D. irregularis*; *Polia xanthomista* is represented by three larvæ. Amongst *Hadena* there are three larvæ of *H. glauca* from Mr. Prest. There is a beautiful specimen of the beautiful larva of *Calocampa exoleta*, which is almost rivalled by the two *Cucullia chamomillæ*; there are four *Anarta melanopa*.

larvæ from Mr. Porritt, and one *Agrophila trabealis* (*sulphuralis*) from Mr. Farn; also two of Mr. South's North Devon larvæ of *Toxocampa craccæ*. Although the larvæ of the Geometridæ are less striking, they are none the less interesting, and many species are fully represented in several varieties; there are six larvæ of the local *Epione paralellaria* (*vespertina*), and six of the as local *Nyssia zonaria*; four imagos and four larvæ (beautiful specimens) of *Phorodesma smaragdaria*, taken in Essex, 11th June, 1884; the curious mottled larva of *Asthena blomeri*. The Eupitheciæ are very full, containing four larvæ of *E. debilitata*; there are two larvæ of the rare *Cidaria reticulata*, and many others of like interest which it is difficult to particularise.

A NEW METHOD OF SUGARING.—Judging of others by my own experiences, probably field naturalists have been at times exercised how to lay their bait when desirous of sugaring large open spaces, such as the sea-shore, sand-hills, the edge of cliffs, open fields, and other similar places where no friendly trees or palings are within reasonable distance. I, therefore, extract the following from the 'Societas Entomologica' for May. Dr. R. Benteli, of Bern, writes:—"I have adopted the following plan for several seasons:—Take an old umbrella, open it, join the extremities of the ribs by string so as to keep them in position, and then cut away the silk entirely; attach to the extremity of each rib a small ring, and on this hang, by means of a piece of bent wire forming a hook, a short piece of string, to the other end of which a piece of sponge, about the size of a fist, is attached, which has been lightly dipped in any bait that may be preferred. Cut away the handle of the umbrella, so as to fix it at will into another stick of two or three feet long, provided at one end with a socket in which to fit it, and at the other end with an iron point by which to fix it firmly into the ground. I have five of such skeleton umbrellas. When closed they pack into a light box of about three feet long and a few inches square, which can be carried over the shoulder by a leather strap, and the whole weighs less than five pounds. The bait is carried in a tin box. I am thus ready to go into, or out of, action in a few minutes, and can try many places otherwise very tedious to work." The writer seems ignorant of our English plan of sugaring trees, for he joins them by a stout string provided at intervals with small rings, and to this hangs his bait, in a

similar manner to that described above. Pieces of dried apple threaded on the string, or pieces of sponge dipped in apple-juice, appears his usual bait; but this may arise from the prevalent idea that beet-root sugar, which alone is in general use abroad, is not attractive to insects.—N. F. DOBREE; Beverley, E. Yorks.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*May 4th, 1887.* Dr. David Sharp, F.Z.S., President, in the chair. The Rev. C. Ellis-Stevens, B.D., of Brooklyn, New York, U.S.A.; Mr. Frederic Merrifield, of 24, Vernon Terrace, Brighton; Mr. Henry Rowland Brown, B.A., of Oxhey Grove, Stanmore; and Mr. Coryndon Matthews, of Ivybridge, Devon, were elected Fellows. Mr. Wm. Warren exhibited a specimen of *Euzophera oblitella*, Z., caught in the Isle of Wight; and, for purposes of comparison, a pair of *Stigmonota pallifrontana*, Z. (a species taken several years ago by Mr. W. Thompson, of Stoney Stratford), and a pair of *S. internana*, Gn., with which the former had been, till lately, confounded. He also exhibited specimens of *Asthenia pygmæana*, Hb., another species new to Britain, and *A. abiegana* (Dup.) (*subsequana*, Haw.). Mr. Stainton remarked that the two last-named species, *Asthenia pygmæana* and *A. abiegana*, both had white underwings, and were in other respects very similar. It was formerly thought that Haworth's *subsequana* was identical with the species previously figured by Hübner as *pygmæana*; but now that the two allied species were critically examined it appeared that the species described by Haworth as *subsequana* was not Hübner's *pygmæana*, but another species known as the *abiegana* of Duponchel, dating only from 1842, so that Haworth's name *subsequana* had priority by thirty years. Mr. F. Pascoe exhibited a specimen of *Diaxines taylori* (Wath.), taken out of the stem of an orchid—*Saccolabium caeleste*—growing in an orchid-house at Croydon, and received from Moulmein, in Burmah. Mr. M'Lachlan exhibited nearly 200 specimens of Neuroptera, in beautiful condition, collected by Mr. E. Meyrick in various parts of Australia and Tasmania, comprising about seventy species. There were between forty and fifty species of Trichoptera, including moth-like forms from Western Australia, allied to *Plectrotarsus*, Kol.; and other

species belonging to a group represented by *Hydropsyche edwardsii* (M'Lach.). Among the Planipennia the most remarkable insect was a new species of the singular genus *Psychopsis* (Newm.), from Mount Kosciusko, where it was common. Of Pseudo-Neuroptera there was a species of *Embiidæ* from Western Australia, and certain curious *Psocidæ* and *Perlidæ*. The Trichoptera appeared to be exclusively confined to *Sericostomatidæ*, *Leptoceridæ*, and *Hydropsychidæ*. Mr. Meyrick made some remarks on the localities in which he had collected the species. Mr. M. Jacoby exhibited three specimens of a new species of *Xenarthra*, collected by Mr. G. Lewis in Ceylon; also a species of *Loxoprosopus* from Brazil. Mr. C. O. Waterhouse exhibited a living example of an Ichneumon—*Ophion macrurum*—bred from a larva of *Callosamia promethea*, a North-American species of *Saturnidæ*. He also exhibited a number of wings of Lepidoptera denuded of the scales, in order to show the neuration for study, and explained the method he had adopted for removing the scales. The wings were first dipped in spirit and then placed in *eau de javelle* (potassium hyperchlorite). Mr. Waterhouse said he had sometimes substituted peroxide of hydrogen for *eau de javelle*, but the action was much less rapid, although the results were satisfactory. Mr. Poulton observed that, although the pigment had disappeared, he thought the scales were not removed, but were merely rendered transparent; and he remarked that the discovery of some chemical for softening chitine had long been wanted to prepare specimens for the microscope. The discussion was continued by Mr. M'Lachlan and Dr. Sharp. Mr. Slater read a note, extracted from the 'Medical Press,' on the subject of the poison used by certain tribes of African Bushmen in the preparation of their arrows. It was stated that a poison was prepared by them from the entrails of a caterpillar which they call "N'gwa." The Rev. W. W. Fowler read a note received from Mr. J. Gardner, of Hartlepool, in which it was stated that *Dytiscus marginalis* possessed the power of making a loud buzzing noise like that of a humble bee. Dr. Sharp said he was familiar with the humming of *Dytiscus marginalis* previous to flight, and thought it might perhaps be connected with an inflation of the body for the purpose of diminishing the specific gravity of the insect; he had noticed also that it was occasionally accompanied by the discharge of fluid from the body. Mr. Wm. White read a paper "On the

Occurrence of Anomalous Spots on Lepidopterous Larvæ." A discussion ensued, in which Mr. Poulton and others took part. Mr. Waterhouse read "Descriptions of New Genera and Species of *Buprestidæ*."—H. GOSS, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—April 28th, 1887. R. Adkin, Esq., F.E.S., President, in the chair. Mr. Helps exhibited *Deilephila livornica* from Coles Cross, near Crewkerne. Mr. Lea, *Tæniocampa munda*, *T. gracilis*, and *Pachnobia leucographa*, taken in Herefordshire at sallow. Mr. South, forms of *Lycæna corydon* and *L. bellargus*; also a specimen of the genus *Zygæna*, which he stated was probably hybrid between *Zygæna trifolii* and *Z. filipendulæ*. Mr. Sheldon, red and clay-coloured forms of *Tæniocampa pulverulenta*, one specimen having the upper surfaces of the wings on one side red and on the other clay-coloured; also a series of *Scoparia angustea*. Mr. Tugwell, bred examples of *Cidaria suffumata*, *Nyssia hispidaria*, *Hybernia marginaria* var. *fuscata*. Mr. Jager, *Eupithecia pumilata*, bred from flowers of clematis and hemp agrimony. Mr. Adkin, very large specimens of *Anticlea badiata*, reared from ova. Mr. S. Edwards, a long series of *Papilio merope*, and Mr. J. Jenner Weir made some observations thereon. Mr. Billups, exotic species of Coleoptera, comprising examples of the family Scarabæidæ, including the genera *Phænœus*, *Onthophagus*, and *Gymnopleurus*; he also exhibited, on behalf of Mr. W. F. de V. Kane, examples of *Mesites tardii*, from Monaghan, Ireland. Mr. J. E. Kelsall contributed a paper on British Bats.

May 12th, 1887. The President in the chair. Mr. Cooper exhibited bred examples of *Aleucis pictaria*, *Macaria alternata*, and *Asphalia ridens* from Epping Forest, and *Spilosoma mendica* from Wanstead Flats. Mr. Cockerell exhibited species of Mollusca and contributed notes, and Mr. Kelsall specimens of Newts and contributed notes.—H. W. BARKER, *Hon. Sec.*

OBITUARY.

REV. JOHN HELLINS.—The Rev. John Hellins died, somewhat suddenly, early on the morning of May 9th, at his residence in the Cathedral Close, Exeter. The cause of death was erysipelas in the throat; his age was fifty-eight. For the last thirty years

his name has been familiar to all readers of the 'Entomologist's Weekly Intelligencer' and the 'Entomologist's Monthly Magazine'; and, in co-operation with the late William Buckler, he succeeded in tracing the life-histories of a large number of our Lepidoptera. The first volume of Buckler's 'Larvæ of the British Butterflies and Moths' contains a most valuable appendix by Mr. Hellins, describing the life-histories of twenty-five of our butterflies, with notes on one or two others. These are described by the talented and regretted author as "stop-gaps"; but they are very necessary and very good ones, especially as they were almost entirely prepared at short notice in the year 1885. The "stop-gaps" in the recently-issued second volume exceed the original matter in length, and treat more or less fully of forty-six species. Well may the editor write:—"The Rev. John Hellins has not only exerted himself, but has enlisted the aid of his friends to an extraordinary degree." We fear this good work and all lepidopterists will greatly feel the loss we so much regret. Mr. Hellins was for some time in early life a master in the Exeter Grammar School; and in 1859 succeeded his father as chaplain to the Devon county prison, which position he resigned some six or seven years ago on account of ill-health. This also affected his entomological work; but it was remarkable, to those who knew the nature of his failing, with what zeal he returned to his former labours of love, both in the church and with his insects. The work contained in the two volumes alluded to are a sufficient monument; but all will deeply regret it cannot be completed. It was indeed a labour of love with him, as far as possible, to complete the work of his lost friend and coadjutor; and would that it had been permitted him to do so.—E. A. F.

THOMAS WILSON.—Many readers, especially in Yorkshire, will regret to learn of the death of Thomas Wilson, of Holgate, York, which occurred on the 17th April, aged fifty-one years. He was one of the oldest York entomologists, having been a collector of Lepidoptera for over thirty years. His attention, however, was chiefly given of late years to the Tenthredinidæ, of which he leaves a good collection. His contributions to the 'Entomologist' and 'Naturalist' were numerous; and he was engaged, up to a few days of his death, upon a list of the Macro- and Micro-Lepidoptera of York and district. He leaves a widow *five children*.—SAMUEL WALKER; 8, Neville Street, York.

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[No. 290.]

THE HESSIAN FLY IN GREAT BRITAIN.

It may seem almost supererogatory, since we are told by Dr. Herbert Loew, of Posen, that a "small library has been written on the subject of *C. destructor*," to attempt to add our mite to the vast store of information that has been worked out for us so generously and perseveringly by scientists in Europe and America. Dr. Packard tells us that the number of writers down to 1883 is fifty-six, and that number has certainly increased and multiplied itself, in proportion as the destruction caused by the gall-gnat has extended its area. It was detected, it would seem, in Europe in 1834, in the Island of Minorca, by Messrs. Dana and Herrick, though it has continued its ravages, with more or less of intermission, for really upwards of a century. In America it appears to have thriven indeed since 1776. And here let it be remarked that it has extended its ravages on a larger scale than in Europe—from the sea-board of the Atlantic to Kansas, and from the Gulf of Mexico to the Lakes and the River of St. Lawrence.

On July 27th, 1886, the first specimens of puparia, as Miss Ormerod informs us in her pamphlet, were sent to her from Hertford, from barley-fields cultivated by Mr. G. E. Palmer. In Essex the puparia appeared on wheat, the case showing the striations that would seem to adapt it to the culms, even more conspicuously. I am especially indebted to Mr. D. Taylor, jun., of Daleally Farm, Errol, near Perth, who has most kindly sent me the puparia on three several occasions during the spring months, and has thus enabled me to hatch the tenants. I have

reared from this bountiful supply about twenty specimens of the gnat, both males and females. Two of these were sent alive to Dr. Meade, of Bradford, to examine, and I append below the results of his careful and closely observed diagnosis. My first Cecid, a male, appeared on May 29th; the 30th yielded me two females, and the imagines have continued to emerge sparingly ever since, mostly every other morning. *C. destructor* is a great lover of moisture, and I would suggest to all who seek to rear it, that the glass-topped boxes should be well sprinkled with water, and that Hypnum-moss should be introduced therein. We thus assimilate Nature, that never errs in her ways and means, and recall, it may be, the dew-clad culms and herbage of the corn-plant. There are two broods in the year; the second brood, we are told, appears in August or early in September. Each female would seem to lay fifty eggs or more on the young winter or spring wheat.

PETER INCHBALD.

Fulwith Grange, Harrogate, June, 1887.

CECIDOMYIA DESTRUCTOR, Say. The Hessian Fly.

This fly has been so often described that it seems almost superfluous to go over the same ground again; but my excuse must be that no complete scientific diagnosis has hitherto been published in any *British* entomological work; and as the gnat has found its way into this country, and may exercise great influence in the agricultural world, a technical account taken from *living* specimens, which will enable the fly to be recognised by entomologists, may not be without its value.

C. destructor, Say.

Thorax niger. Abdomen carnosum, feminâ maculis nigris quadratis disjunctis, mare confluentibus, signatum. Antennæ 17-articulatæ, mare petiolatæ, feminâ sessiles. Epistoma cirro nigro instructo. Pedes testacei nigro-hirti. Alæ nigrescentes, radicibus rufis. Long. mas. 2, fem. 3 mm.

FEMALE.—The female being the larger, more abundant, and more characteristic sex, I shall first describe it, and then mention the distinctive points of the male.

Head. Eyes, with forehead and occiput, black, the last clothed with thick and strong black hairs. Epistome prominent, and furnished with a tuft of black hairs. Palpi yellow, the four joints

being partly covered with black scales, which are more numerous on the second than on the first and third divisions, and entirely cover the terminal joint. Proboscis very small, and of a pink colour. Antennæ rather more than a third of the length of the body, yellowish brown, consisting of seventeen joints shortly verticillated with black hairs. The two basal joints are nearly twice as thick as the others; the first is club- or rather cup-shaped; the second nearly globular; the next are all smooth and cylindrical (turning irregular in size and shape when dry), about twice as long as broad, becoming gradually rather smaller towards the end, and terminating in an elongated tapering joint, which is about half as long again as the one before it. Collar or neck pinkish yellow.

Thorax black, with grey reflections, having a few scattered white hairs on the sides, and two indistinct lines of thinly placed white hairs along the dorso-central region.* A pinkish red irregular-shaped streak or patch runs from the side of the neck along the lower side of the thorax to the base of the wing. *Scutellum* black, prominent, and crested with black hairs. *Halteres* pale red, irregularly clothed with patches of black scales.

Abdomen pinkish or yellowish brown, with eight segments; the first is nearly black; all the others are marked on each side of the dorsum with a large square velvet-black spot, which spots are separated by a considerable longitudinal space from those on the opposite side on all the intermediate segments, but become nearly confluent on the seventh and eighth joints.† A single row of similar large square spots runs down the centre of the ventral surface. The oviduct consists of three joints; the basal one is thick and rounded, the second and third are cylindrical, the last one being of about half the diameter of the second, pointed, and without lamellæ. They are all pale red, the terminal one being brown at the tip.

Legs pink, becoming brownish yellow after death, clothed irregularly with black scale-like hairs, which are generally thicker in the neighbourhood of the joints. The coxæ are brown, the short fore femora or trochanters black, the others yellowish brown.

* See Osten-Sacken's Essay on Comparative Chaetotaxy.

† Miss Ormerod, in her excellent paper upon the Hessian Fly, has described a small V-shaped mark on the back of the seventh and eighth segments. I was not so fortunate as to see it in the specimen which I examined.

The ends of the tarsi and fore tibiae are generally darker than the other parts.

Wings pink at the roots, and clothed with black hairs; the second longitudinal vein runs nearly straight until near its extremity, when it curves slightly down and reaches the border of the wing a little above (or before) the apex. The third longitudinal vein gives off its descending branch in the usual way, which reaches the hind margin of the wing at a point exactly opposite the termination of the first longitudinal vein.

MALE.—The male insect differs from the female by being about one-third shorter, and much more slender. The antennae have the same number of joints (seventeen), are pedunculated, and proportionally longer, being about two-thirds of the length of the body. The joints are ovoid in shape, becoming nearly globular towards the end. The terminal joint is not longer than the others, as in the female. The stalks are about half as long as the joints. The verticellar bristles are much longer than those in the female, and white in colour. The tuft of hairs on the end of the scutellum is also white.

The *abdomen* is almost black, with a pink extremity, but is really marked in the same way as the female, with large square black spots, only being very slender they coalesce; thus the two lateral rows cover the dorsum, only leaving a narrow pink line



Male genital organs from above.

down the centre, which is sometimes indistinct, and a pale streak across the edge of each segment. The spots on the ventral aspect hide the underlying colour altogether. The last joint of the *abdomen* is of a pale pink colour, and is provided with a pair of *claspers* or *forceps* of a brown colour, between which are seated

the generative organs, the peculiar structure of which is now found to be of great importance in the determination of nearly allied species among various insects, but which it is very difficult to describe without the aid of figures. Two thick blunt processes, which project forwards, are placed between the roots of the forceps, each of which has a small rounded eminence on its extremity. Beneath and behind these, occupying a central position, is an elongated tapering organ extending nearly to the joints of the claws of the claspers, which is flanked on each side by a flattened hairy process with a dilated extremity. These organs are of a pink colour.

The *legs* are rather paler than those of the female; the fore coxæ are pink.

The *wings* are proportionably longer than in the female, and less nigrescent. Mr. Inchbald tells me that when they are first expanded, "a ruddy tinge is observable throughout the wing." This is less conspicuous in the female.

R. H. MEADE.

1, Mount Royd, Bradford, June 15, 1887.

REPORTED OCCURRENCE OF *POLYOMMATUS GORDIUS* IN DEVONSHIRE.

MR. F. G. JOHNSON, a pupil at the Rev. T. Cross's, The Old House, Blundells School, Tiverton, Devonshire, writes under date of May 25th:—"I caught at Tiverton, in July last year (1886), a copper butterfly, which has since been examined at the Natural History Museum, and is pronounced to be the variety *hipponocæ* of *Polyommatus gordius*."

Dr. Lang, in 'Butterflies of Europe,' plate xxi., fig. 2, portrays male and female of the typical *gordius*, which is a very conspicuous insect, expanding from 1·16 to 1·40 in. The habitat is given, "Valleys in Switzerland and the Tyrol, South-Western Europe, and Sicily." He does not mention this variety.

Upon enquiry we are informed that Mr. Johnson is beyond doubt as to *bonâ fides*. It would nevertheless be most desirable to try to find other specimens before accepting this butterfly as a British species.

JOHN T. CARRINGTON.

Westminster, S.W., June 15, 1887.

THE LATE SEASON IN KENT.

By J. W. TUTT, F.E.S.

FOLLOWING one of the heaviest rainfalls on record,—Thursday night and Friday,—Saturday, June 4th, was a glorious day in North Kent. Having been a close prisoner in Strood, owing to the rain, on Thursday and Friday, I made an early start on Saturday morning. Reaching Cuxton shortly after 10 a.m., I made at once for the chalk-hills, and expected to be soon at work. So I was; and my total, at the end of two hours hard work, was *nil*. One *Nisoniades tages*, three or four *Cænonympha pamphilus*, and *Lycæna icarus* were all I had seen.

Making my way into a clearing in the adjoining woods, I fared a little better. *Acipitilia galactodactyla* larvæ, about as large as they usually are at Easter, were more sparing than usual; and here I took *Lycæna argiolus* flying over the blue-bells. I learnt that this species frequented the blue-bell flowers from a Yorkshire correspondent, only a fortnight ago. *Euchlaena cardamines* was apparently just out. I netted a few (all males), and found they were in splendid condition; one male I kept, a fine variety. The edge of the costa of the anterior wings is broadly orange, and the tip of the wings, instead of being of the ordinary blackish colour, is much suffused with orange, which gives it a peculiar golden colour, very different to the ordinary "orange" colour at the apex of the wing; altogether it is a beautiful insect. Here also I found *Penthina gentiana* (larvæ and pupæ) in the teasel-heads. Some of the larvæ were not more than half-fed, whilst one of the moths emerged yesterday morning (June 5th). This insect must be on the wing an enormous time; some of the smaller larvæ I obtained cannot emerge, I should say, for at least six weeks or a couple of months. *Eupæcilia maculosana* and *Venilia macularia* were flying freely.

Passing out of the clearing again I made for a sunny bank, where I can always take, in the early summer, *Panalaria leucohoekella* and the probably *pseudo-latreillella*. They were in some plenty, but they are difficult to see, and a great deal of care is wanted to make up even a small series. I cannot help thinking that the stumpy form and want of white scales in the antennæ of

male specimens, supposed to be characteristic of *latreillella*, is anything but an artificial separation. I can get them of all sizes, —some exceedingly small, some comparatively large,—flying together at the same time. The fine ones are sometimes large and sometimes small; but worn ones have very few, if any, white scales on the antennæ, whether large or small. As it was now nearly 3 p.m., I tried a little beating on the edge of the wood, and at the end of half an hour had scored one *Botys pandalis* and one *Bapta bimaculata* (*taminata*); the former was well up to time, the latter generally occurs here about three weeks earlier. The pretty little *Asthenes candidata* was common. I also beat a fine specimen of *Phoxopteryx derasana* out of blackthorn. After 4 p.m. matters gradually improved, a short series of *Argyrolepis subbaumanniana* was obtained; a very early date for this species; I generally take it from the end of June to the end of July. Is this a late spring brood? Longer series of *Dicrorampha plumbagana*, *Pyrausta purpuralis*, *Eriopsela fractifasciana*, *Ennychia nigrata*, and *Phytometra viridaria* (*ænea*) were netted, flitting about the flowers on the banks. *Cochylis aleella* (*tesserana*) was just appearing, as were also *Eupæcilia anthemidana*, *Sciaphila hybridana*, *Catoptria ulicetana*, *Ephippiphora trigeminana*, *Crambus pratellus*, and *Anaitis plagiata*. I also took an odd specimen of *Penthina sellana*, for which it is an early date, June 20th to July 5th being the usual time. An odd specimen of *Bapta temerata*, and a freshly-emerged female *Phalera bucephala* were picked off the grass; and two little *Gelechias* still puzzle me. *Nisoniades tages*, *Syriethus alveolus*, *Pieris napi*, and *P. brassicæ* now and again crossed my path; but of *Lycæna bellargus*, *L. astrarche*, *L. minima*, and *Argynnis euphrosyne*, generally in swarms at this time of the year, I did not see a specimen.

Hybernated females of *Gonepteryx rhamni* were busy ovipositing on the buckthorn on the edges of the wood. Of the *Tineinæ* very few were on the move. The common *Lithocolletidæ* were only just appearing, and nothing like fully out. A few *Ornix betulæ* and *O. anglicella*, with odd specimens of *Elachista cygnipennella*, *E. pollinariella*, and a few other equally common species, made up the total of one of the poorest day's work I have done for the last fifteen years, at this time of the year.

The season is altogether out of time, and I should say nearly

a month late. I saw very little (except *A. subbaumanniana* and *P. sellana*) that ought not to have been expected fully a month ago. The vegetation, however, looks beautiful, and the clearings in the woods are magnificent,—blue-bells, columbine, speedwell, primroses, forget-me-not, and orchids vying with each other, and making a sight that defies description. The trees, I am pleased to say, are infested to a remarkable degree with Tortrix larvæ, so probably we shall have a little livelier time later, than we have just at present.

Blackheath, June 6, 1887.

NOTES ON *VANESSA ANTIOPA*.

By REV. F. A. WALKER, D.D., F.L.S.

I HAVE been given to understand that British and Swedish specimens of this butterfly had white borders, and that those from the South of France and elsewhere on the Continent had yellow. My own experience on the subject is as follows:—

All the specimens of *V. antiopa*, without exception, that I have seen exposed for sale at any of the London dealers have had yellow borders.

I have nine specimens in my collection, labelled N. America, all with yellow borders. To the best of my recollection these came from Ontario, and were purchased from Mr. Higgins, then of 24, Bloomsbury Street; though it is possible that one or two French or German specimens have accidentally got mixed with them.

On two occasions, on my purchasing a cheap lot of British insects from working people, I have found the collections to contain a couple of *V. antiopa* with yellow borders; but these were at once admitted to be continental—there was no attempt to pass them off as British.

I have two specimens in my collection, labelled Europe, with yellow borders. One of these two is in singularly fine condition and as large as any, and larger than most that I possess; and is, moreover, of historic interest, having been caught, as well as many more butterflies, by the late John Curtis, F.L.S., author of 'British Entomology,' Francis Walker, F.L.S., and Hen-

Walker, in their memorable tour in the South of France in the summer of 1830.

I have only seen two specimens of *V. antiopa* alive—one that I failed to capture in the Black Forest in the summer of 1857, and really do not recollect the colour of its borders; the other I caught on ivy blossoms on a low wall on the hill-side above Menaggio, Lake of Como, in the summer of 1872. This one has yellow borders, but somewhat faded compared with my other specimens, and is otherwise not in first-rate condition. Not being familiar with this insect in a living state, I failed to recognise it until I had taken it out of the net, having been under the impression that I had succeeded in capturing one of the large Satyrids, *Minois proserpina* or *M. hermione*, for example.

I have two specimens, beyond all question British, with white borders, of which the history is as follows:—Both are from the grounds of Arnos Grove, Southgate, and are the worse for wear, possibly from not having passed through the hands of an entomologist in the first instance. One was captured flying by or across the New River, I believe by someone fishing at the time. The other was caught by a boy or boys of the school at the bottom of the Cottage Walk, Arnos Grove, and given by the schoolmaster to my father. I cannot speak positively as to the date, whether 1820 or 1830, but am fully persuaded that it was at least, if not more than, fifty years ago.

When staying at the house of a relative, Little Heath, Potter's Bar, I was given to understand that some haymakers had noticed some large butterflies while they were at work, and on proceeding to question them on the subject, was told that the said insects (*V. antiopa*?) had "a sulphureous band all round them."

I believe that the yellow borders are far more frequent than the white, and also that the butterfly was far commoner in this country towards the end of the last century than it is at present.

It may be remarked, in conclusion, that *V. antiopa* is more variable in size than any other of our English Vanessas. Large specimens probably exceed in size any of the Vanessidæ, except such monarchs of the race as the African *Junonia anacardii*, *Salmacis amarantha*, and the like.

Dun Mallard, Cricklewood, N.W., June 1, 1887.

THE METAMORPHOSES OF *GALERUCA NYMPHÆA*, LINN.

By H. E. QUILTER.

WHILE out by the side of Groby Pool, one Saturday afternoon early in July, 1886, I noticed and admired the show of *Polygonum amphibium*, L., which was then in bloom. I was thinking over the modifications the plant must have undergone to adapt itself to being amphibious, as at the same time the year before, owing to the drought, the water had gone down, and the plant was flowering on a dry beach.

My attention, however, was soon attracted by the fact that upon the upper surface of the long floating leaves—so characteristic of this plant—were numerous insect larvæ. An examination soon convinced me that they were the larvæ of a coleopterous insect. Noting also that they were preparing to pupate, I took home a quantity upon the leaves. They were generally clustered together upon the upper surface, but some had crawled upon the stalks of grass growing out of the water. Placing them in a box with a glass lid, I had the pleasure of watching the insect through the later stages of its metamorphosis. Owing to the difficulty, generally, of observing the changes undergone by beetles, the observation of them, even in the commoner species, is of interest; but when the beetle is uncommon, as in this instance, the interest and utility is augmented.

The earlier stages of this beetle are as yet, so far as I am aware,* unknown; when and where the parent insect deposits its eggs, so that the larvæ upon leaving the egg can feed upon an aquatic plant, is somewhat puzzling, especially when we recollect that the insect is not an inhabitant of the water. I may perhaps be allowed to suggest that, from what I saw of the habits of the perfect insect, the parent deposits its eggs at the roots—which are generally left dry or partially so about that time of the year—of the plant upon which the larvæ subsequently feed, and that the larvæ are consequently aquatic, coming up out of the water, as already noted, to pupate upon the leaves and stalks of aquatic plants. I have before mentioned that when the larvæ were found they were preparing to pupate. They were not eating, and were motionless.

The larva is about five-sixteenths of an inch in length, and

[* De Geer described and figured the earlier stages of this beetle upwards of a hundred years ago (*Mémoires*, v. 405, pl. x., figs. 3-6; 1781), and cf. Westwood's *Introduction*, i. 382.—E. A. F.]

has the usual number of segments—thirteen; the three segments near the head bearing two legs each. Underneath it is of a yellow colour, the upper surface of the segments being black, with the yellow body showing between; they appear to be again divided, but the division ends at the side in a roundish prominence, from which spring two or three hairs. The whole body of the larva is covered with hairs. The cephalic segment is very small, and bears rudimentary antennæ and palpi, composed of three joints each, the apical joint being pointed. The caudal segment is also very much smaller.

After remaining motionless for a time, usually two or three days, the skin begins to split along the upper side of the larva, commencing with the cephalic segments. When this has properly commenced the insect seems restless, and moves upwards and downwards. This movement seems to act upon the skin and splits it farther, until the opening extends the whole length of the insect. This usually took about half an hour, and was done in the early morning. The skin is not entirely drawn or slipped off, but is still fastened to the hinder segments, and serves to hold the pupa very securely to the leaf to which the skin itself adheres. This is a wise provision, as otherwise the helpless pupa might be washed off into the water and drowned. The pupa, which the cast-off skin discloses, is of a golden-yellow colour, but in about five hours turns quite black.

The pupa is quiescent, and the parts of the perfect insect are very plainly seen. The head is applied against the breast, the antennæ lie along the sides of the thorax, the first two pairs of legs are entirely exposed, the other pair being covered by the elytra. After remaining in this quiescent state for seven days, the perfect insect emerged. The pupa-skin commenced to split up along the back, as in the larva, and was drawn off in a similar manner, revealing the beetle or perfect insect. Not until the insect has partly emerged does it make any sign of movement: when the antennæ are fully exposed it begins to move them upwards, slowly and by degrees, until they are in their proper position; then the first and second pairs of legs are used to push off, as it were, the enveloping skin, and the perfect insect is fully emerged. It is then of a golden-yellow colour, the antennæ and legs being of a darker colour, as also the elytra, which do not appear to alter.

When first emerged the insect walked about for a short time, and then generally crawled under the leaves until it had assumed its normal colouring and was fully able to fly, which happened in from two to three hours. At this time the body was quite black, and the legs and antennæ nearly of the same colour. The beetles ate the dead leaves in the box, and were rather lively, seeming to be gregarious, congregating together under the leaves. After keeping them for some time, an unfortunate accident during my absence deprived me of the pleasure of watching their habits further.

The life of an insect, as we have seen in the later metamorphoses of a beetle, is one continued series of changes. These are not merely from the larva to the pupa, and from the pupa to the perfect insect,—during which it acquires new organs,—but consist also of repeated sheddings of the skin, which occur at intervals, before the larva has attained its full size. It was at this period that I found the larvæ described.

The question may naturally be asked, why does the insect undergo these metamorphoses or changes? The answer will come appropriately from the 'Origin of Species,' where the author says:—"The embryonic state of each species reproduces more or less completely the form and structure of its less modified progenitors"; and Herbert Spencer says:—"Each organism exhibits within a short space of time a series of changes, which, when supposed to occupy a period indefinitely great, and to go on in various ways, instead of one way, gives us a tolerably clear conception of organic evolution in general."

The present developmental history of a beetle really represents therefore the modifications which the species has undergone in past time; and as Sir John Lubbock says:—"That the ancestors of beetles, under the influence of varying external conditions and in the lapse of geological ages, should have undergone changes which the individual beetle passes through under our own eyes, and in the space of a few days, is surely no extravagant hypothesis."

It may be asked, whether, in looking over the records of the past history of the earth, we find anything by which the evolution of a beetle from other forms of life can be inferred; and here it must be confessed that Palæontology does not furnish us with any direct evidence with regard to the evolution of beetles. We remember, however, that the crust of the earth, within

which is written its ancient history, must be looked upon as poorly written, and with whole pages lost; so that we are left to look to Embryology for light upon the subject; and it is generally admitted that the structure of the embryo and its developmental change—either within or without the egg—indicate as truly the course of organic development in ancient times, as the rocks and their sequence teach us the past history of the earth itself.*

ENTOMOLOGICAL NOTES, CAPTURES, &c.

COLIAS EDUSA IN JUNE.—Yesterday, at Effingham, in company with Mr. S. J. Capper and Mr. H. Vaughan, I saw a specimen of *Colias edusa*, and trust it may be a precursor of another *edusa* season.—T. H. BRIGGS; Surrey House, Leatherhead, June 20.

LYCÆNA VARIETIES OR HYBRIDS IN KENT.—It may perhaps be of interest to record the capture by my boys and myself, during the present month, of pale varieties or hybrids similar to those taken in June last year. We have secured very perfect examples of both male and female forms; all were taken on the same ground as those last season, but they appeared to be more distributed. As Mr. South's suggestion in the April number of this year's 'Entomologist' (p. 79), that "there may be similar forms in other cabinets," has elicited no response, I can only suppose that the specimens taken by us are peculiar to this spot. Whether they are a distinct species, simple vars. of *L. bellargus*, or hybrids between that species and *icarus*, I am unable to determine, but most probably the latter; and if so, unions between the two species must be a tolerably common event here; but why not elsewhere also? I have never myself met with anything at all like these pale varieties, although I have collected for many years; but they may have been in existence at this spot long prior to last season, which was the first in which I worked for *bellargus* in this particular locality. I shall hope to take notice of the exact time of the first emergence of second brood of *bellargus* and the continuance of *corydon*, and supply you with a further note on this matter. I would only now say that the suggestion made to Mr. South by "entomologists who have had

* Abridged from Trans. Leicester Lit. and Phil. Soc.

much experience" (Entom. 81) has simply astounded me. I do not think I have passed a single season without meeting with *corydon* and *adonis* flying together at one and the same time. Even my boys, mere lads, are conversant with this fact. We have observed this at various places in this county, in Sussex, and at the Isle of Wight. I of course am not prepared to say that the same thing obtains in all localities, but in the counties I have named unions between *corydon* and *bellargus* have been most decidedly possible, and any number of them too.—E. SABINE; 22, The Villas, Erith.

AMPHIDASYD BETULARIA, var. DOUBLEDAYARIA.—Of the few odd specimens of this species that I have bred at one time or the other, the result has always been perfectly black varieties, and have never yet bred the normal form. I should be glad to know if this is generally the case elsewhere in the north.—A. E. HALL; Norbury, Pitsmoor, Sheffield.

TEPHROSIA BIUNDULARIA AND T. CREPUSCULARIA.—*T. biundularia* was first noticed by me this year, in a state of nature, in Shooter's Hill Wood on June 6th, when two males occurred. I have occasionally seen them since, up to last night, when I netted two (rather the worse for wear) flying at dusk. One or two collectors who devote all their energy to the larger species must have taken a considerable number, as one collector showed me several in a box on June 15th. Ova of *T. crepuscularia* laid in the last week in April, from Somerset, hatched May 16th. Some began to go down on June 15th and 16th; others which hatched at the same time as these are not more than half-grown. Ova of *T. crepuscularia* laid during the last week in April, from Perth, hatched May 20th. One or two went down June 15th; the others are, with only two exceptions, pretty well full-fed. I am anxiously looking forward to rearing July specimens of this brood, as a second brood never occurs in a state of nature near Perth. My *T. crepuscularia*, even from the north as well as those from the south-west, were nearly full-fed larvæ when *T. biundularia* first began to appear in the south, and whilst *T. biundularia* are still flying *T. crepuscularia* (south and north) are pupating.—J. W. TUTT; Rayleigh Villa, Westcombe Park, S.E., June 16, 1887.

LOBOPHORA VIRETATA.—I have at length succeeded in obtaining the larva of this local Geometer, a few eggs having been laid

on my setting-boards by captured females, which hatched in about a week. I supplied the young larvæ with flowers of holly and mountain ash, in addition to privet leaves. I found, however, that the two flowers alone were eaten, the holly being decidedly preferred; and when, in about a week, my stock of flowers failed, I substituted the young berries, which are now (June 24th) being greedily devoured by the fast-growing larvæ. The insect occurs abundantly in Sutton Park, where hollies also abound; but the precise connection between the two has not, I believe, been previously ascertained. Possibly some of the Birmingham collectors may be able to find the larva feeding at large on the berries of the holly, and may thus confirm my observation. I hope to describe the larva more at length when full-grown; at present it reminds me, in point of colouring, of that of *Asthena blomeri*.—(Rev.) CHAS. F. THORNEWILL; The Soho, Burton-on-Trent.

LEPIDOPTERA OF LULWORTH COVE.—During a short stay at Weymouth, in August last, I availed myself of an opportunity afforded by a steamer to visit Lulworth. The time at my disposal for collecting, I regret to say, consisted of but a few hours, besides which I had not even the opportunity of choosing a favourable day, as these steamers only run to Lulworth on certain days and at stated times. I left Weymouth in the forenoon, and after a short run landed at Lulworth. The weather was anything but desirable, being cloudy, with a cold and rather boisterous wind blowing. I first clambered up the side of the hill in the direction of Weymouth, but, although I went over a great deal of ground, I saw nothing worth taking. On retracing my steps back to the little bay I came upon a gentleman, who had been collecting the greater part of the morning, and had caught some twenty specimens of the local *Hesperia actæon*. This gentleman kindly directed me to the spot where *H. actæon* chiefly resorts, and after some searching I was fortunate enough to obtain a couple of specimens, male and female. They did not rise until nearly stepped upon, and were easily captured. I saw several other collectors, who had come probably for the especial purpose of capturing this species; and I was informed that large numbers of people visited Lulworth annually for the same reason, so that it does not seem improbable that only a few years will elapse before it will become as extinct in Britain as *Polyommatus dispar*; and the discovery

of the larvæ of *H. actæon*, which I believe has occurred comparatively recently, will doubtless add to its decline, as it did in the case of *P. dispar*. The list of other specimens seen and captured during my short stay is very meagre. *Melanargia galatea*.—I only saw and captured some two or three specimens of this insect, although August is one of the months it may be expected to turn up. This species is very variable in colour, my own specimens being considerably lighter in colour than the specimen delineated in Kirby's 'European Butterflies and Moths,' pl. xi., fig. 9. Coleman's 'British Butterflies,' pl. v., No. 3, show a specimen which in shade nearly resembles my own. I saw two specimens only of *Satyrus semele*, but only succeeded in taking one, a fine male. I took only one specimen of *Lycæna corydon*, which I did not expect to find so scarce here, as it apparently was; for, although I cannot find Lulworth mentioned as one of its haunts, it is generally to be found in abundance in chalky districts in the south. This is one of the species with which Mr. South has dealt so ably and exhaustively in these pages. I regret to say that the specimen I obtained at Lulworth is far too battered for any minute comparison with the examples given on Plates I. and II., attached to his valuable paper; but the examples to which it appears to bear most resemblance are as follows:—On the upper surface to fig. 9, Pl. I.; and on the under side to fig. 2. The remaining specimens seen and captured were far too common to need any comment. Exception, however, should be made of *Zygæna filipendulæ*, which exists here in extraordinary profusion. The day of my visit the ground was strewn with the perfect insect, whilst to nearly every tuft of grass numbers of empty pupa-cases were attached, the moths having nearly all emerged. Doubtless, with a greater amount of time at disposal, some insects which on that occasion seemed scarce would be found to be not uncommon in the locality, whilst many other specimens, not mentioned here, would be added to the list.—W. G. McMURTRIE; South Hill, Radstock, Bath, May 12, 1887.

TAPINOMA MELANOCEPHALUM, *For.*—Whilst walking in the Palm House, Kew Gardens, in September last, my attention was drawn to what at first sight appeared to be a host of small dipterons, travelling with great rapidity up and down the stem of a species of palm (*Howea grisebachia*) from Tropical Australia. After considerable difficulty I succeeded in capturing some few

specimens, when I found they were a species of ant hitherto unrecorded in this country. *Tapinoma melanocephalum* was first described by Forel from Cayenne, then from the Tonga Islands, and latterly from Bahia and St. Thomas. Forel also found it on board of one of the West-Indian mail-steamers. It has also been found in India, Oceania, and Tropical America; but this is its first recorded capture in Europe. This brings the number up to seven species of exotic ants found in Kew Gardens by Messrs. Smith, Saunders, and myself.—T. R. BILLUPS; 20, Swiss Villas, Coplestone Road, Peckham, S.E.

NOTES ON COLEOPTERA.—A cold wind and cloudy sky are not greatly to be desired when one is looking forward to a pleasant day's collecting; and the morning of May 30th was about as cheerless as possibly could be when I started for Waterloo Station to meet Mr. Cripps, whence we proceeded by train to Surbiton, thence walking through the fields to Claygate, Oxshott, and Esher. The foliage generally was wet, and beating out of the question; sweeping and searching being the order of the day. For some little time our net proceeds were comparatively nothing; but as the weather brightened matters improved. The first captures were made at a felled tree,—two nice specimens of the scarce *Hypulus quercinus* located under loose bark. Some vigorous sweeping resulted in a few *Prasocuris aucta*, three *Cneorhinus exaratus*, two *Tanymecus palliatus*, a stray *Lebia chlorocephala*, one *Grypidius equiseti*, two *Orobitis cyaneus* (a very singular-looking beetle, with legs folded up and rostrum bent over, it bears a strong resemblance to a black seed—I almost discarded it as such): other captures were *Alophus triguttatus*, *Ceuthorhynchus campestris*, *Balaninus glandium*, &c. *Ceuthorhynchideus troglodytes* occurred commonly, but not so profusely as in former years. Larvæ of the lepidopteron, *Ino statices*, were numerous on sorrel; many apparently full-fed, but others still very small. I captured *Anthicus antherinus* in the pathway leading through the covers at Claygate; this was an interesting capture, as, though the insect is plentiful enough at Rainham, Essex, hitherto I had not taken it in the Esher district. During the afternoon Mr. Newbery came over, and we continued our researches on the heathy portions, beating oak, birch, and pine; obtaining therefrom *Cœliodes rubicundus*, *C. quercus*, *Rhynchites betulae*, *Orchestes salicis*, &c. The pits were unproductive, being

infested with sand-martins. At the Black Pond we found *Elaphrus cupreus*, *Anchomenus gracilis*, and *Cyclonotum orbiculare*. Later in the evening, by sweeping a marsh, we obtained *Pæderus littoralis* commonly, two or three *P. caligatus*, *Coccinella 19-punctata*, *Bryaxis sanguinea*, and a few other things. On June 4th, in bright sunny weather, I proceeded alone to same district. After the heavy downpour of June 3rd, progress through the flooded foot-path and drenched fields was rather tedious; but, all things considered, I had tolerably good sport. *Otiorhynchus scabrosus* was soon captured; and, getting to a small patch of hawthorn-blossom, I beat out *Clytus mysticus*, *Polyopsia præusta*, *Rhynchites æquatus*, *R. germanicus*, *Anthonomus pedicularis*, and *A. rubi*; from an old stump I obtained *Rhizophagus ferrugineus* and several Cissidæ. I commenced sweeping, but dragging the net through the soddened herbage proved a heavy task, and I netted a considerable quantity of water and very few beetles; getting on to higher ground I obtained *Cionus scrophulariæ*, two *Tanymericus palliatus*, about twenty *Alophus triguttatus*, a few *Barynotus obscurus*, *Cneorhinus exaratus*, *Hypera punctata*, *H. fuliginosus*, *Prasocuris aucta*, *Anisotoma calcarata*, *Phyllobius calcaratus*, Bruchidæ, *Limoniæ minutus*, &c. Among Lepidoptera, larvæ of *Ino statice* were still prevalent, and *Porthesia similis* (auriflua) very abundant in hawthorn; *Euchloë cardamines* were plentiful during the afternoon; I saw also several *Cilix glaucata* (spinula) drying their wings in the hedges; and a few *Emmelesia albulata* flitting about in the evening. I made an excursion on June 11th to Loughton. Saw plenty of *Bembidium 4-guttatum* and *flammatum*, and captured a few *articulatum*; also took *Phytobius waltoni*. By sweeping *Genista anglica* I got several *Apion geniste* and *Strophosomus obesus*. The hawthorn-blossom yielded *Rhynchites æquatus*, *pauillus*, *æneovirens*, *germanicus*, *Adimonia sanguinea*, *Anthonomus pedicularis* (plentifully), *Polyopsia præusta*, and one *Clytus mysticus*. On June 18th I went to Rainham, Essex, in scorching hot weather. *Bembidium concinnum* swarmed on the river banks; *Malachius viridis* were common; swept a stray specimen of *M. æneus*, which induced me to search for more of this pretty beetle, and I eventually found sixteen others on *Dactylis* flowers; likewise *Leptura livida*, *Lema melanopa*, *Telephorus lateralis*, *T. litura*, and *Mordellistena pumila*. On June 21st I went to Basingstoke canal. The special purpose of this trip was to obtain

various species of Donaciæ. Having selected the most likely places, I prepared for wading operations by taking off boots and socks, and turned up my trousers,—the best way to ensure success if Donaciæ are at all obtainable. My captures were as follows:—Seventy-five specimens of *Donacia linearis* and *D. thalassina*, four *D. comari*, two *D. sericea*, eight *D. sagittariæ*, and six *D. hydrochæridis*,—in all one hundred specimens. Other captures were *Lina longicollis*, *Cassida viridis*, *Colymbites tessellatus* (from old tree stumps), *Phyllopertha horticola*, *Gyrinus marinus*, *Luperus betulinus* (very common), *Erihrinus nereis* (profusely), and other small species.—G. A. LEWCOCK; 40, Oxford Road, Islington, N. [I have found *A. antherinus* not uncommonly sometimes in the neighbourhood of Claygate and Esher.—T. R. B.]

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—June 1st, 1887. Dr. David Sharp, F.Z.S., President, in the chair. Mr. Philip Crowley exhibited the following specimens of Diurni, from the Kareen Hills, Burmah:—*Papilio zaleucus*, Hew., *Papilio adamsoni*, Smith, *Papilio* ? sp. (male and female), and *Nymphalis nicholii*, Smith. Mr. T. R. Billups exhibited several specimens of an ant found at Kew, frequenting a species of palm from Tropical Australia, and which had been determined as *Tapinoma melanocephalum*; also living specimens of *Carabus auratus* from the Borough Market, and of a species of *Blaps* from Northern Africa. Mr. Waterhouse exhibited a specimen of a Brazilian Locust, *Conocephalus* ? sp., which he had for some time preserved alive, and which had only died that same morning. He called attention to the change of colour which he had observed in the eyes of this insect; in a bright light they were dirty white or horn-coloured, with a black dot in the middle; but at night, or if the insects were confined in a dark box, they became altogether black; shortly after death, also, the eyes became black. Mr. M'Lachlan observed that he had noticed a darker spot in the centre of the eye in certain Ephemeridæ, and in other Neuroptera. The discussion was continued by Dr. Sharp and others, but no one seemed to be able to account for the alteration in question. Lord Walsingham exhibited specimens of *Cateremna terebrella*, Zk., a species lately taken in

Britain, which he had caught in Norfolk, and bred from fir-cones gathered in the same locality. Mr. Meyrick read two papers, "On Pyralidina from Australia and the South Pacific" and "Descriptions of some exotic Micro-Lepidoptera." In these papers about sixty new species were described. A discussion ensued, in which Dr. Sharp, Mr. Stainton, Mr. M'Lachlan, and others took part. Mr. Meyrick stated that, as far as the Pyralidina were concerned, Australia could not be regarded as a separate region, for a large number were not endemic, but appeared to have been introduced from the Malay Archipelago. The method of this immigration seemed doubtful. Mr. Meyrick was of opinion that the insects flew very long distances, and effected a settlement through their food-plants being widely distributed and common. He instanced the undoubted immigration of certain Australian species into New Zealand, a distance of 1200 miles. Mr. Stainton adduced the instance of *Margarodes unionalis*, which is a South-European insect, feeding on the olive, yet is occasionally found in Britain. Mr. Meyrick exhibited, in connection with his paper, *Oxychirota paradoxa*, Meyr. (unique specimen representing the family Oxychirotidæ), *Epharpastis dædala*, Meyr., and *Mixophyla erminea*, Moore. Mr. Meyrick also made some observations on the distribution of the insect fauna in the various regions of Australia; he said that it appeared to be more or less different in certain defined portions of the continent, which might be roughly regarded as oases in the midst of desert districts; all his observations, however, had tended to upset Mr. Wallace's theory that Eastern and Western Australia were originally separated, as the gradations in the insect fauna from east to west were quite gradual; in Western Australia the Tineina were the only group well represented by peculiar endemic forms. Mr. Pascoe read a paper "On the genus *Byrsops*," a genus of Curculionidæ. The President announced that Lord Walsingham's collection of Lepidoptera and larvæ, recently presented to the nation, would be exhibited in the Hall at the Natural History Museum, South Kensington, until the end of June.—W. W. F.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. — May 26th, 1887. R. Adkin, Esq., President, in the chair. Mr. Cooper exhibited forms of *Spilosoma menthastri*, Esq., bred from pupæ received from Scotland. Mr. Adkin, bred examples of *Brephos notha*, Hb., *Pachnobia leucographa*, Hb., and

Aleucis pictaria, Curt. Mr. S. Edwards, twenty-nine species of *Papilio*s, including the following: *P. ædippus*, Gray, *P. marchandii*, Bois., and *P. cloanthus*, L. Mr. Billups, living specimens of *Carabus auratus*, L., found in the Borough Market, in baskets of radishes from the South of France, and stated that this was the sixth year in succession it had been found in London. Also *Cetonia floricola*, Hbst., from Bordeaux; and species of *Blaps* from the Holy Land. Also the following Hymenoptera: *Cheiro-pachus quadrum*, Fab., from Hayling Island; *Blennocampa aterima*, Klug., from Chobham; *B. alternipes*, Klug., from Loughton; and *Allantus marginellus*, Pz., from Hayling Island, and contributed notes.

June 9th.—The President in the chair. Mr. West exhibited, on behalf of Mr. Beaumont, three varieties of *Abraxas grossulariata*, L. Mr. S. Edwards, living larvæ of *Orthosia upsilon*, Bork. Mr. Wellman, living larvæ of *Acidalia rusticata*, Fb. Mr. Jager, *Eupithecia albipunctata* (bred). Mr. Turner, a dark variety of *Ematurga atomaria*, L., taken at Loughton. Mr. Mera, bred specimens of *Fidonia lumbaria*, Fb., and *Eupithecia venosata*, Fb. Mr. Adkin, on behalf of Mr. L. Gibb, a larva of *Apatura iris*, L., from the New Forest. Mr. Billups, *Pelophila borealis*, Pk., from Co. Armagh, Ireland, taken by the Rev. W. F. Johnstone; *Lasio-derma testaceum*, L., and contributed notes; an immense number of a species of *Apanteles*, and a *Microgaster*, with their cocoons, from larvæ of *Melitæa aurinia*; also two species of Diptera of the genus *Phora*; and two species of parasitic Hymenoptera, one a *Chalcid*, and the other a species of *Aspilota* bred from larvæ found mining the leaves of *Aquilegia vulgaris*. — H. W. BARKER, Hon. Sec.

ANCIENT ENTOMOLOGICAL LITERATURE.

"One hundred & twenty Copper-Plates of English Moths & Butterflies, representing their Changes into the Caterpillar, Chrysalis & Fly States, & the Plants, Flowers & Fruits whereon they feed. Coloured with great exactness from the Subjects themselves. With a Natural History of the Moths & Butterflies, describing the Method of Managing, Preserving, & Feeding them. By BENJAMIN WILKES. To which is added an Index of the Insects & Plants, adapted to

Linnæus's System. London: Printed for Benjamin White, at Horace's Head, Fleet Street. MDCCLXXIII."

SUCH is the title-page of a strange old book, which has fallen into my hands, though not my possession, a short description of which may perhaps interest some of your readers.

Pasted inside the book is a "Dedication to the Worthy Members of the Aurelian Society," enclosed in a wreath of flowers, and all round the margin of the page are coloured figures of the larger caterpillars, wherein *Atropos* is called "the Bee Tyger." The dedication is well worth quoting:—"Gentlemen,—Permit me the honour of laying before you Twelve new Designs of English Butterflies: creatures whose Elegance and Variety of Beauty demand our admiration. Ignorance long imagined them the Spontaneous Productions of Putrifying Matter and undesigning Chance: Causes as little able to form an Animal as to create a World: but your Discoveries have Rectify'd that mistake and prov'd them to proceed from Parents like themselves: after a constant tho' wonderful Order of Generation. The pregnant female, with unerring Sagacity, deposits her Eggs in some Concealment, where the infant brood may find, as soon as hatch'd, immediate and proper Sustenance. Here they feed and thrive and cast off several skins, till arrived at full growth, every Species in a manner peculiar to itself, is changed into an Aurelia: whence in due time a Moth or Butterfly issues forth, array'd with all the glories of its parent. This too partakes the Joys of Love, lays Eggs and dies: and thus one race succeeds another in an uniform and unalterable manner. The care that has been taken to render these designs exact representations of Nature, may, I hope, recommend them to your favour, and excuse the presumption of, Gentlemen, your most obedient Servant, BENJ: WILKES."

In the Preface, after a passing tribute to the memory of "that well known and ingenious Naturalist Mr. Joseph Dandridge" and his "noble Collection," the author goes on to answer "some ill-natured people, that love to find fault with everything," who have found fault with him for "enriching his Undertaking with some of the most beautiful Productions of Nature in the Vegetable Kingdom"; explaining that, as most caterpillars feed on the oak, elm, blackthorn, whitethorn, willow, and nettle, he has judged it unnecessary to repeat those subjects, and has merely placed a *small fragment* in the plate, making the main subject one of the

above productions of Nature. I am bound to say that his plates display more truth in the way of food-plants than this led me to expect. Passing thence to nomenclature, he compliments "the Aurelian Society and several other ingenious gentlemen, because they, from time to time, have thought proper to bestow some Name on every Species that has come within their knowledge," modestly adding that, while retaining suitable names already given, he "has presumed to bestow names on such as either had none at all, or which he thought not sufficiently denominative of the particular Flies intended to be known by them," making the names descriptive of "the shape, colour, marking, food, or place where found."

The Introduction mentions, among other things, that "it frequently happens that the Fly does not come out at the usual time, but continues in the Chrysalis state till that time Twelve-month." That "the Goat Moth is three years proceeding from the egg to the Fly-state." That "the Caterpillars are divided into naked and Cloathed kinds": which principle of classification he follows throughout the work, mixing up Macros and Micros. That "some Caterpillars feed upon the Waters naked and exposed and others make themselves Cases of Sticks, Rushes, &c., in the Waters, where they get their food." He notices "the surprising Quickness and Distinction in the Sense of Smelling in the Males, when in quest of the females—exceeding that of the Blood Hound." Butterflies are distinguished from Moths by their clubbed antennæ, the Burnets being nondescript. The Introduction concludes with a quotation from 'The Universe,' a poem by Mr. Henry Baker, comparing the metamorphoses of the fly to those of the man.

Then follows a list of the months, with the moths that occur, and the localities, among which are "The Banks about Chelsea Water Works and such like places" for the hawk tribe. The first ten days of July are to be devoted to the Purple Emperor in Comb Wood, by Kingstone, in Surrey. And when "the Purple Emperor begins to grow bad, the Time comes on when *the second Breed of the Swallow Tail Butterfly* is quite fresh." Rotherhithe Marshes and the low grounds by Vauxhall are great localities, and in October comes the Admirable Butterfly.

As to methods, the net is of gauze, "like a Bat-fowling net: one Ell long, $\frac{3}{4}$ of a yard wide at the bottom and $\frac{1}{2}$ a yard at the top, sewed to a tape, that it may be fastened to a couple of Hassle

or other Sticks, five feet long each, the upper part whereof should be bent circular to fit your net." Having netted your insect, you kill it by squeezing, "pin it with that side uppermost which is most beautiful; then stick in your box, and look out for more Sport." Setting is done leisurely with card braces, the wing being raised even with the nose of the fly; and small moths and such as stiffen quickly must be set on small boards, while in the fields caterpillars and moths are to be got by beating, and Aurelias by digging.

So much for the earlier part of the work. The classification is entirely by caterpillars, depending on their nakedness, hairiness, protuberances, and tufts; with the result that the Angle Shades, Black Thorn Moth, Small Elephant, and Sword Grass, with several Micros, come all under one heading; the Admirable and several Fritillaries under another; the Blue Argus and Purple Emperor under another; while the generation of the Glory of Kent and the Cleifden Nonpareil is unknown.

The plates are excellent, displaying the insect in several positions, with the larva, pupa, and often the ova.

Two captures of the Willow Butterfly near Camberwell are recorded in August, 1748. *Sphinx convolvuli*, said to feed in the larva state on the bindweed among the corn. *Lasiocampa pini*, taken by the author himself in the larva state once on whitethorn bush near Richmond Park in the middle of September, 1748. The *Noctua delphinii* is beautifully figured in all its stages along with its food-plant, the wild larkspur; and it is said "to have been bred in England by the Honourable Mrs. Walters and by Nathaniel Oldham, Esq., but that it is very rare." The Swallow-tail Butterfly seems to have occurred commonly about Cookham, near Westram, in Kent, and, as above mentioned, to have been double-brooded.

A few of the plates I fail to recognise, but the majority are, for the time of publication, wonderfully accurate; and the flower part, which the author apologises for in the Preface, is admirably executed.

Altogether, the book, with its quaint hints as to methods and implements, reminds one of the old days of walking up your birds with a pointer and shooting a dozen brace on a good day. But I have already said much more about it, drawn on by the charm of its antiquity and the quaintness of its expressions, than I originally intended, and must conclude with the wish that more of your readers could see it for themselves.

G. M. A. HEWETT.

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PROTECTIVE COLORATION.

By G. V. HUDSON.

PROBABLY one of the most interesting subjects in connection with Entomology is the protective colouring of insects. I have read with great pleasure a most exhaustive paper relating to this matter by Mr. Roland Trimen (Entom. xviii. 25), and now propose to offer a few remarks on the same subject in connection with some of our New Zealand species, where, I think, protective colouring is unusually prevalent.

Commencing our observations with Coleoptera, we find a curious beetle (*Enarsus bakewelli*) which, when at rest with its legs, &c., closely packed away, exactly resembles a pellet of mud about the size of an ordinary bean; this is not owing to the adhesion of any particles of earth, &c., on the insect, but is most evident in perfectly clean specimens. Another insect (*Rytinotus squamulosus*) bears an equally close resemblance to a piece of stick; in fact, when I first took this species amongst rotten wood in June, 1883, at Palmerston North, I was doubtful as to its coleopterous nature until I had carefully examined it with a lens, and was quite unable to persuade some friends it was a beetle until I had compelled it to walk about on the table. The rare weevil, *Ectopsis ferrugalis*, is more remarkable in its resemblance to a short stick cut diagonally, the ends of the elytra suddenly sloping down, their colouring at this point resembling that of the section of a small twig. I should imagine this must be a purely accidental circumstance.

Among the Lepidoptera, the curious *Argyrophenga antipodium* mimics the blades of the tussock grass by the silvery stripes on the under surface of its wings, which renders the insect almost invisible when it closes its wings and settles in the grass, which it habitually does when pursued. The large *Charagia virescens*, when perched in the branches of its native tree (*Aristotelia racemosa*), can only be distinguished with difficulty from a leaf. I found a fine male specimen in this situation on October 22nd, 1885, which is the only living specimen I have ever seen or taken in the open (Entom. xviii. 34).

Turning to the Noctuidæ, almost all the colouring is protective; the delicate green mottling of *Hadena vigens* renders it quite invisible on moss-grown trunks, while the markings of *Hadena lignana* and *Agrotis debilis* closely resemble old lichens.

The Geometridæ nearly all imitate dead leaves and the trunks of trees in their colouring, those of the genus *Declana* resembling the lumps of lichen, &c., adhering to them. *Cidaria verriculata* is very curiously coloured, the wings being ornamented with a number of parallel yellow and brownish lines extending right across the insect. They are perfectly straight, and are also continued on the body, and thus form an uninterrupted series. The under surfaces of *Dasyuris perornata* and *D. partiliniata* are ornamented with silver streaks, resembling the grass which they inhabit.

Among the Micro-Lepidoptera protective colouring is equally prevalent, the insects comprised in this division imitating stones, lichens, and the excrement of birds in their markings, some of the resemblances being very exact.

The imitative propensities of the Phasmidæ among the Orthoptera are so well known that it is almost unnecessary to mention them here. So complete indeed is their resemblance to the twigs of plants that I have frequently caught hold of an insect quite unintentionally. The sexual disparities existing in this family are also very curious, the males being only about half the length of their partners and much more attenuated. Their identification is a matter of the greatest uncertainty, as I am confident that their colouring often undergoes a complete alteration owing to their environment, green species being found on young succulent plants, while brown ones are invariably discovered on the trunks of trees, &c., where such colouring is

more protective. Among the larvæ of some Lepidoptera this rule holds good in an increased degree. I will take as examples the two common bush-moths, *Boarmia dejectaria* and *B. panagrata*, both of which I have frequently reared.

The former (*B. dejectaria*), when feeding on the malvæ (*Melicytus ramiflorus*), is light pea-green, exactly resembling the twigs of the plant. When feeding on the white rata (*Metrosideros scandens*) it is dark brown, thus harmonising equally well with the almost black branches of that plant; while those individuals which feed on fuchsia are bright green with reddish markings, thus imitating its young leaf-bearing shoots. Finally, bluish grey larvæ of *B. dejectaria* may be occasionally beaten from the New Zealand nightshade (*Solanum aviculare*), a plant whose branches are of that hue.

In the case of *B. panagrata* we have, firstly, a dull olive-green caterpillar feeding on the kawakawa (*Piper excelsum*). Its colour is perfectly protective, the larva increasing the deception by coiling itself into a semicircle and sitting on the twig, thus appearing exactly like the numerous joints which occur at intervals up the stems of this plant. Secondly, a brownish larva feeding on the "currant" (*A. racemosa*), which adheres closely to the twigs, and during cold days seeks shelter in the burrows of *Charagia virescens*, where large numbers may often be discovered while cutting out the pupæ of that insect. Thirdly, we find a totally different-looking caterpillar feeding on *Myrtus bullata*, which is again the larva of *Boarmia panagrata*, imitating the colour of its food-plant.

It is needless to say that when I first found these larvæ I was confident they belonged to six or eight different insects, and was much astonished to find them result in the two common species above referred to. I must also mention that the perfect insects (*Boarmia dejectaria* and *B. panagrata*) are extremely variable, and I have noticed that the dark varieties of the larva give rise to the dark varieties in the perfect insect, and *vice versâ*; but as I have not reared a very large number of these insects, this result may be due to one of those coincidences which so frequently deceive us in these matters.

I think I have now said enough to show that protective colouring is very prevalent among New Zealand species; but I must also add that the insects themselves are all extremely

secret in their habits. Walking through the bush on a hot summer's day, the entomologist cannot fail to be impressed with the paucity of insect-life around him compared with a similar situation in England, and will very probably exclaim that there are no New Zealand insects worth speaking of. In this, however, he is somewhat mistaken; for although they are unquestionably very much less numerous here than in the old country, yet there are a great many more than anyone would imagine, judging from first impressions only.

Wellington, New Zealand, May 20, 1887.

ON COLLECTIONS OF LEPIDOPTERA.

By WM. BARTLETT CALVERT, F.E.S.

ANSWERING Mr. F. H. Perry Coste's article (Entom. xx. 93) about "Collections of Lepidoptera," my idea is that future students of British Lepidoptera will learn far more of the habits, economy, and ways of living of the different species of British Lepidoptera, by making their own collections, than ever they would had they only access to some type collection.

The science and study of Entomology is not blindly restricted to Entomology alone, but embraces Geography, Topography, Botany, and many of the physical laws of Nature. What could be learnt of the ways and habits of the *Cossidæ* by studying in a museum only? All we would gather by such a study would be the difference of form, colour, size, and variation of certain genera and species in connection with others, or the variation of a certain species taken in different localities; but we should be as ignorant of the modes of life as we still are of the life of pre-historic man. To my idea, all who wish to study profoundly any one part of Entomology must make his own collection, set his own insects, and leave the buying of typical collections to colleges and schools (for elementary teaching in these establishments this would be the only way to procure a collection).

How much may be learnt by setting Lepidoptera? Only those who do a great deal of this kind of work can tell; in setting one is able to study the flexibility of the wing (which could not be done by type-study alone), its debility, hardness, &c., in bringing

up to position on the setting-board, things which could *never* be learnt by museum-study. Another great drawback to typical collections for scientific study is that not always one is able to dispose of a spare hour for study during the hours a museum might be open, whereas had the student a collection of his own it is at his disposal whenever he has a spare moment (his not being restricted to any special hours is a great advantage for true entomological study); also, should he wish to destroy any of his specimens to study the neuration of any particular group, he is *at liberty* to do so, for I am sure *no museum* could afford to have their types destroyed, however great might be the desire of the student to do so (even for deep and scientific research). That a typical collection of British Lepidoptera (as also of the other branches of Entomology) should exist in each of the provincial museums I do certainly agree in; that young collectors may there be able to compare their specimens with typical ones, so that, when they have any species which they are doubtful of, there is the type to help them in their difficulty. Again, speaking of Entomology as a business,—Who studies Entomology as a means of earning his daily bread? Not one in a thousand, for all who take any delight in this beautiful study do it, I am sure, from motives of pleasure, and at the same time that it serves as a recreation from daily toil, so that the time *lost* in setting is more than regained by the practical knowledge we acquire of the strength of the tissues of wings of different genera, and which could *never* be learnt by any other means than manipulation while fresh (for even damped specimens have not that flexibility and delicacy of wing to be found in recently-caught specimens).

Mr. F. H. Perry Coste asks, What is the logical *raison d'être* of a collection of Lepidoptera? (1st) To show the fauna of a country or part of a country; (2ndly) to be able to see at a glance the relation one form bears to another; and (3rdly) a student of Entomology needs something to reanimate him now and again from hard study, and nothing is better able to awaken the theoretical part of it than the practical part of forming a collection.

Of what educational value is such a collection? Of the greatest; as I have aforesaid, we cannot always find half an hour spare time to go to the museum during its open hours, nor can we learn *much from coloured drawings* (as the neuration is never

well-defined); therefore our only resource is to have our own collections, for better lose time in setting specimens we have ourselves caught than to be running to and from our house to the museum; that would indeed be time lost, and if during the winter we are caught in a nice drenching rain and get a fine cold, then it would not only be *time* lost, but both *health* and *patience* into the bargain.

From an educational and scientific standpoint, is the game worth the candle? It may or it may not be; for, according to whom the collection belongs, so will its worth be. To the working man (many of whom I believe have fine collections, and who do a great deal of *real scientific work*) the collection is only too well worth the candle, for how many of these hard and sturdy workers (at their death) leave their families almost penniless, whereas their collections would always fetch a pretty good sum (especially for a fine local one), enough at any rate to keep things going until "something turned up."

Many more remarks I might bring forth to show the value of individual collections, but I am afraid to tire both the editor's and reader's patience; but I also hope to see this discussion continued, and may they all tend to the same end as this, *i. e.*, to encourage young students to study from their own work.

Colegio Yngles, 13, Nataniel, Santiago de Chile, May 25, 1887.

NOTES ON LEPIDOPTERA OBSERVED IN LONDON.

By PERCY RENDALL, M.D.

DURING the past six or seven years I have taken notes of the appearance of insects which I have seen in London, and though I do not pretend to have much new light to throw on the question of the metropolitan fauna, yet the subject, as far as I am aware, has received so little attention that it seems to me to be worth while, in view of Mr. Sharp's promised list, to mention briefly, with notes of any matter of interest respecting them, the species which I have seen within two miles of the Marble Arch, *i. e.*, in Ladbroke Square; the more so, as I shall, perhaps, be unable hereafter to amplify the list.

DIURNI.

Pieris brassicæ, *P. napi*, and *P. rapæ*. *Colias edusa*, some years ago, probably the last "*Edusa* year." *Vanessa polychloros*, one captured and two seen. *V. urticæ*, common over flower-borders all through the summer. *V. cardui*, occasionally seen in autumn, with *V. atalanta*. *Polyommatus phloxæas*, scarce.

BOMBYCES.

Smerinthus populi, one at light in a drawing-room (July 1st, 1885), and larvæ on poplar. *Dicranura vinula*, larvæ on poplar. *Arctia lubricipeda*. *Zeuzera pyrina*, noticed years ago, and again this year; larvæ of *Sphinx ligustri*, were occasionally found on privet bushes. *Phalera bucephala*, sometimes found on walls or pavements in the neighbourhood, having dropped or been blown off various trees. *Cossus ligniperda* infested a willow tree, which they killed; then they were noticed in an almond, which became moribund, and was also cut down; the lower part I possessed myself of, but, although I kept it for years and introduced new blood from a colony that was flourishing in a hawthorn tree close at hand, I was only able to hatch out one imago. *Orgyia antiqua* swarms everywhere, and emerges in successive broods over a space of several months; the males I have noticed dancing about in the sunshine all through the summer, and I have captured them by exposing the apterous bred females. I noticed, when breeding them, that the latter always greatly outnumbered the former. I am as cordial a hater, for various reasons, of the useless and mischievous house sparrow as Mons. A. Wailly (Entom. xx. 128) and the would-be growers of spring bulbs, who this year complained in the 'Standard'; yet I feel bound to admit that, though the sparrows disregard this insect as a larva on account of its hairiness, they devour it largely when in the pupal state.

NOCTUÆ.

Acronycta psi. *A. aceris*, larvæ on sycamore in neighbourhood. *A. megacephala*, frequently found settled on trees; the larvæ freely on poplar, but constantly found crawling on walls, &c., when full-fed. *Mamestra brassicæ*, too common; larvæ very destructive to garden plants. *M. persicariæ*, taken at rest occasionally; larvæ on white jasmine. *Agrotis exclamationis*, imagines disturbed from

box-edgings, &c. *Tryphæna pronuba*, an invariable pest. *Tæniocampa instabilis*, at rest. *Euplexia lucipara*, the larvæ on everything, and completely defoliating all ferns; they were found very easy to breed, and absolutely exempt from all ichneumoniform attacks. *Hadena oleracea*, settled and bred *Xylophasia monoglyphæ*. *Habrostola tripartita*, at dusk. *Plusia gamma*, constantly noticed over flowers in broad sunshine. *Gonoptera libatrix*. *Mania typica*, in profusion at dusk over flowers. *Catocala nupta*, at sugar; never noticed at rest in daytime.

GEOMETRÆ.

Uropteryx sambucaria, seen in plenty from June 28th onwards, larvæ on ivy after hybernation. *Rumia luteolata*, very common. *Eugenia quercinaria*. *Biston hirtaria* were fairly common, though I can answer for the fact that Ladbroke Square is not one of those places where Newman found them, as he says, "twenty or thirty crawling up one tree." I have noticed the imagines from April 14th to May 10th, the females always outnumbering the males in the proportion of ten to one; the males come out first, and are much more lively and handsome in coloration. *Hemero-phila abruptaria*, taken at rest in characteristic manner with wings outstretched, and settled out of reach, a habit I have often noticed rather marked in this species. *Boarmia gemmaria*, very common, feeding on bark of jasmine in early spring. *Phorodesma pustulata*, at dusk. *Halia vauaria*, over flower-beds. *Acidalia virgularia*. *A. aversata*: the banded form, which Newman figures as the variety, has always been found commoner than the type. *Panagra petraria*, at light. *Abraxas grossulariata*, in the greatest abundance, the larvæ feeding by preference on a small kind of ornamental evergreen shrub (*Philorrhæa*?), often stripping it of leaves. *Eupithæcia oblongata*, settled on walls, trees, &c., with *E. vulgata* and *E. absynthiata*. *Camptogramma bilineata*. *Melanippe fluctuata*, larvæ found and reared on nasturtium, &c.

PYRALIDES, &c.

Pyralis farinalis. *Eurrhypara urticata*. *Ebulea sambucalis*.

The Tortrices seen were unfortunately not specially noted; and as this was the case, though the Micro-Lepidoptera were fairly represented, I refrain from entering into particulars, at present.

The above notes, though without doubt very incomplete, as

regards many of the commoner species (which I fancy might turn up were it possible to make systematic search for them with the aid of the sugaring-tin), contain all the species that I have definite notes, made at the time, of having taken, and for which I can personally answer. For the information of those who are unaware of the position of Ladbroke Square, I may say that it is less than two miles west of the Marble Arch, and is one of the largest of the London "squares," the area being roughly about three acres. It is situated on a heavy clay soil, and slopes from north to south. The nearest open space of any entomological promise is Lord Holland's Park, towards the south-west.

With regard to collecting in London, one fact is particularly before my mind, which is, that I have never found a moth on a street-lamp, though it is difficult to help searching them when one is out after dark.

One is naturally led to wonder what good insects might have been taken, in times past, in a locality where, even in the last few years, I have seen blackbirds', thrushes' and hedgesparrows' nests, with eggs, and where in the early morning rooks and starlings may still be seen feeding. The chaffinch and robin are constantly heard singing during the summer months, and to my knowledge nest in the neighbourhood. I have seen spotted flycatchers feeding a family of four, who were sitting on a bough waiting their turn whilst the parents hawked for insects; they also must presumably have been bred in the immediate vicinity. Flocks of blue tits can be noticed occasionally searching the acacias, and instances of this kind might be multiplied.

Let me add to this the evidence of one of the assistant gardeners, who has often told me with great gusto how, twenty years ago, his work used to be "not to run over the lawns with a mowing machine, but to cut down the thistles and docks, which, bless your soul, Sir, were as high as my waist."

With the advance of "sootilisation" we have various destructive influences at work, such as the death of all the oak trees, killed by the London smoke and fog, the constant digging of the ground, and the total destruction of all weeds, that form such an important article in the dietary of many moths in the larval stage. The comparative immunity which moths enjoy from the attacks of birds is more than counterbalanced by the myriads of gas-lamps luring them to destruction, and the total absence of all "cover"

in the shape of long grass, brambles, or undergrowth. The limes, which might do something for them, seldom flower, and all trees within a month after coming into leaf become coated with a mixture of dust and soot, that appears to form a most effectual barrier against everything but a very rapacious appetite. The complete absence of any "London form of melanism" (such as has been attributed to the manufacturing districts, where the black *Amphidasys betularia* has been taken) has always seemed to me the most effectual evidence that there can be here no influence brought to bear by food or surroundings. Except for the interest attaching to the acquisition of exact details concerning the species that still remain near us, I found that collecting in London was waste of time; yet on the capture of such things as *Vanessa polychloros*, *Smerinthus populi*, *Phorodesma pustulata*, and *Hemerophila abruptaria*, one is naturally led to speculate what rarities might have been taken on the same ground before that relentless octopus called civilisation spread its arms of bricks and mortar, over the forests and fields of Middlesex.

16, Little Grosvenor Street, W., May 20, 1887.

COLLECTING AUTUMNAL LEPIDOPTERA.

By JOHN T. CARRINGTON, F.L.S.

AMONG the autumnal Lepidoptera counted rare is *Cirrhædia xerampelina*; an easy species to take when we know how. How many gas-lamps have I clambered under the impression that every yellowish moth was the prize, of those days, to find only some other less valuable capture. Even when found at light they are usually singed, and seldom in good condition. How different was the appearance of these handsome moths when I found out how to get them—larger and finer than bred. Walking one afternoon, about the second or last week in August, by the side of Knavesmire, near York, I noticed a spot of yellow on one of a row of ash trees. That spot of colour was the first of a long series of *C. xerampelina*. If I remember rightly, I took that afternoon between seventy and eighty specimens, just as they emerged from pupæ. The way to get them is to search the

trunks of detached ash trees in fields or parks a couple of hours before and up to dusk, when they may be found drying their wings. The grass for six or eight feet round the trees should not be neglected, for often a stray moth will be found. I never had a second opportunity of working those trees, but I have found these moths in other localities in the same manner, though perhaps in less numbers. In the park at the back of Douglas, Isle of Man, the dark variety *unicolor* occurs. I never found many, perhaps one in a dozen, amongst the typical forms. *C. xerampelina* is a generally distributed species, and any detached ash trees should be searched; those growing in hedgerows are hardly worth the trouble, as the moths get away among the grass and twigs, and are difficult to find.

In fir woods the trunks of *Pinus sylvestris* may be examined in the same manner as just described, for imagines of *Thera firmata*, which comes out much after the manner of *C. xerampelina*, but when drying hangs with the wings over the back much longer than the latter species. The second brood may be sought for towards the end of August. I do not think enough attention has been given to the examination of tree trunks late in the afternoon; many other species might be found in this way.

When the feathery trusses of flowers of reeds (*Phragmites communis*) burst into bloom, a grand feast is set forth for hungry moths. Sometimes half a dozen may be found on a single spike of flowers by the aid of a lantern. These vary in rarity according to locality, and I have often wished I could work this style of collecting in the fenlands, where possibly some good things might turn up. How is our rare *Xylina lambda* (*zinckenii*) taken on the Continent? It has only been found in this country, so far as I remember, in the spring, after hybernation. Where the reeds have been cut, examine the short standing stems if a series is wanted of *Nonagria lutosa*. Among autumn flowers is ragwort, but everyone knows all about the various species to be taken thereon at night.

For those who have never worked the blossom of the heather (*Calluna*) by lamp-light, there is a treat in store. Given, a tolerably still night, especially if the flowers have not become general, but early patches are dotted about, and the exhibition of living Lepidoptera is enough to make the most cynical or misanthropic moth-catcher thaw into benevolence, for how can he take

all that he sees? The genera *Noctua* and *Agrotis*, especially, are represented; *N. glareosa* and *N. castanea* in the one, and *A. agathina* in the other. Where it occurs, *Celæna haworthii* frequents this bloom; but we need not expect that moth if no cotton-grass occurs thereby.

Several Geometers affect heather-bloom, such as the handsome *Triphosa dubitata*, in all the freshness of recent emergence. In all, I know no more interesting collecting than this: associated with balmy weather of early autumn, brilliant colours of pink flowers and green leaves, intensified by the concentrated lamp-light, an occasional patch of grey lichen or brightly-coloured fungus for change; a stillness of night that is almost oppressive, broken only perhaps by another ardent lepidopterist, more assiduous than yourself, who is heard diligently making his way through the little paths between the bunches of heather, with sundry grunts and snuffles loud enough to attract attention long before he reaches your range of light. Turn on your lantern to welcome him, and silence again reigns. You soon find the culprit with little bright black eyes and a half-eaten *Noctua neglecta*, the richest red variety you have seen, still held fluttering in his teeth. Touch him, and he coils round, the fattest hedgehog you would wish to meet. Many have I seen, especially in Scotland; and experience has taught that it is little use following them, for hardly a moth is missed by them.

Where hemp-agrimony grows, the flowers are well worthy of examination both by day and by night, as are also those of the devil's-bit scabious, which by day are most attractive to Diurni, especially Vanessidæ; *Vanessa c-album* is very fond of these flowers. On chalky soil in the south, more especially in the daytime, a series of *Eremobia ochroleuca* may be taken early in August, on the flowers of the other scabious (*arvensis*).

Curiously, autumnal moths seem more susceptible to the attractions of light than their spring brethren. Gas lamps should be carefully examined and a fixed light placed in convenient places. Some nights, as is so well known, are much more suitable than others. There are some nights when anything may be expected. I remember one especially good night, a few years ago, near Gravesend, when I saw at the lamps that evening almost every division of the Lepidoptera, the butterflies being represented by a lively specimen of *Vanessa atalanta* and

one *V. cardui*, sufficiently dissipated-looking to suggest that it was not its first night's wandering.

Nothing need be said about autumnal sugaring or collecting at ivy-bloom, both being so well understood and popular; but has daylight sugaring been tried? For the *Vanessidæ*, to those who want them or other daylight insects, sugaring flowers in rides of woods will be found well worthy of trial. If *V. antiopa* gets within scent of that sugar, it is likely it may become a prisoner.

Autumn is the time to fill up one's blanks among the members of the genus *Peronia*. These moths have a habit of sitting during the afternoon for an hour or two before flight, in September and October, in warm, sunny situations. I have taken good series of both *P. lipsiana* and *P. maccana* off the upper sides of bracken leaves in Scotland, where they were also to be found upon the leaves of bilberry, when bracken was absent. *Peronia rufana* occurred on the leaves of the sweet gale and dwarf willow on the moors; *P. mixtana* on the heather; *P. schalleriana* and *P. comparana* in the woods on any leaves; *P. comariana* and its varieties occur on strawberry leaves in gardens; *P. variegana* on roses, willows, and hawthorn; *P. hastana* on willows, especially the dwarf varieties near the sea-side on sand-hills. *Peronia cristana* is, of course, more local, but not so much so as *P. permutana*, which frequents the beds of dwarf roses on the sand-hills near Wallasey, Cheshire. They are best smoked out, by which means I have taken a hundred specimens in a single afternoon.

Smoking out Lepidoptera in autumn is very profitable, if properly conducted, but highly dangerous if any carelessness occurs. I have tried all the plans recommended in books and otherwise, but found none so easy or effective as by the commonest fuzees. Those with stems wrapped with wire were best. If a gentle wind blows, hold one of these fuzees down close to the ground before striking it, when the smoke will get well into the herbage and bring out everything, spiders included. Many a good bag have I made by this means, but great care must be taken to see that each fuzee is quite extinguished before lighting another, or we may have more smoke than we care about. A dozen boxes will do a good afternoon's work. The herbage should not be too stunted, nor too much of one character, for a mixture of food-plants is suggestive of a variety of species

of insects. Micro-lepidopterists will find this mode of collecting very remunerative.

We may now turn our attention to the collection of autumnal larvæ. A good selection of collecting-ground is half the cause of success in this work. Of course it depends much upon what is wanted. A pleasant day may be spent upon sand-hills, where there is an abundant growth of bedstraw (*Galium verum*), in hunting for larvæ of *Deilephila galii*. It may be none are found, but if the reverse happens its beauty and rarity will compensate the finder for many failures. I have found it twice—once on the sand-hills north of Shoreburyness, in Essex, and once on those at Wallasey, near Liverpool. Although so large an animal it is not by any means easy to find, the protective coloration of the skin being so beautifully complete. Look, not for the larvæ at all, but for the little pellets of frass; when once found they should be traced forward by their freshness, until a little track of foot-marks is seen in the sand, which also followed brings us to our capture. A heathy place studded with small birch, oak and other trees, just outside a large wood, is a likely place to take autumnal larvæ by beating, which, by the way, need not be the laborious work I have seen some men make of it, to the detriment of the trees and the annoyance of the proprietors. I have said elsewhere, I think, in these pages, but I venture to repeat, that night-work is much more productive than beating by daylight. Then is it that the larvæ are feeding more loosely, and drop into the inverted umbrella at the least tap of the beating-stick. It will be found that two collectors can do this kind of collecting much more successfully than one by himself. One holds the light and boxes the larvæ, while the other beats until he is tired, and then turn "turn about."

Probably some of my friends will, on reading these notes, consider them very elementary, and so they are; but I make no apology, for there are among our readers some to whom they may be useful. We have always a large leaven of young beginners, who require but a hint to stimulate them to good work, and to them these remarks are addressed.

Westminster, S.W., July 25, 1887.

NOTES ON LYCÆNIDÆ IN NORTH KENT.

By J. W. TUTT, F.E.S.

MR. SABINE'S communication on "*Lycæna* varieties or hybrids in Kent" (Entom. 181) is interesting, so far as he seems to have found the pale "*icarus*-coloured" varieties widely distributed, though the fact has been known to the Rochester collectors for a long time. The "butterfly-catchers" who collect for "sport" used to take (1871—75) a large number of these forms, with the type, everywhere on the chalk-hills between Rochester and Maidstone, on both banks of the Medway.

Mr. Sabine states that Mr. South's suggestion (Entom. 79) elicited no response, and supposes that the specimens taken by him "are peculiar to this spot." I should like to know what spot. Mr. Sabine, whilst taking to himself the whole value of a discovery, and apparently asking for information, takes great care to keep his locality a secret.

The form occurs in all places with the type, as I previously noticed, between Rochester and Maidstone, and through North Kent almost to Gravesend. I should not be surprised if Mr. Sabine's locality is a corner of this greater area. My specimens of this form came from Cuxton and Bluebell Hill, near Rochester. I have paid but little attention to the butterflies during the last five or six years, but have no doubt that it still occurs. I know that a Rochester collector took some in August, 1885, on Bluebell Hill.

I cannot suppose that it is a distinct species. As a lad (between the years 1871 and 1875), when I captured several, there was never the slightest doubt in my mind other than that it was a peculiar form of *Lycæna bellargus*. In some butterfly-book I then possessed I remember reading an extract to the effect that lilac-coloured *bellargus* were captured by one of our older entomologists, and the cause was put down, I believe, to a thunderstorm or some other atmospheric effect occurring. Perhaps some of the readers of the 'Entomologist' can point out the extract. The under side distinguishes it at a glance. It is perfectly typical.

The hybrid theory I consider is too far-fetched, although both Messrs. South and Sabine in opinion incline to it. Will

either of these gentlemen point out in nature anything at all compatible with Mr. South's suggestion? I yield to no one in my admiration of the theory of evolution, but this seems really to be carrying it too far. I can understand a particular form becoming so modified by its environment, as ultimately to produce a distinct species; but to suppose that distinct species like *icarus* and *bellargus* copulate freely together in nature, and that their offspring fly only with the species of one parent (in this case *bellargus*), seems more than improbable. Had Mr. South suggested atavism, or a recurrence to the primitive type of the group, the primitive type being probably *icarus*, I should have agreed with him; but to suppose that a species, once developed as such, naturally intermixes freely with another has, I venture to say, no parallel in nature. Mr. Sabine, after stating that he believes them to be hybrids, knocks his own theory on the head with the pertinent question, "but why not elsewhere also?"

I think the suggestion that the variety "may have been in existence at this spot prior to last season" amusing. Does Mr. Sabine think that permanent local varieties, which are well distributed, grow in some miraculous manner in one season?

My own opinion about the matter I have briefly stated. Nothing that I know of in the localities seems to indicate why some *bellargus* should be typical in colour whilst others are not. We might, if wholesale hybridisation occurred, apply the principle to all our "blues," and Mr. South has well pointed out how variable in shade are *icarus* and *corydon*, as well as *bellargus*. *Icarus* males are sometimes nearly as bright as typical *bellargus*, sometimes purple-coloured. *Corydon* looks sometimes nearly white; in others the species has such a dark band that the blue shade looks very different. In *bellargus* we have three shades: (1) the bright brilliant blue, (2) a more purple-coloured but still *adonis*-blue, and (3) the lilac-coloured, called by Mr. Sabine the pale variety.

Mr. Sabine mentions another matter, the continuance of *Lycæna corydon*, and second emergence of *L. bellargus*, and brings the testimony of two lads to bear out his point, to the discomfiture of Mr. South and the "entomologists of much experience." Mr. Sabine's boys have been butterfly-catching now, as I believe, for seven years, a very good apprenticeship at

a few of our small number of native Diurni; but for all that Mr. Sabine is misleading. With a cold June *corydon* is late out, and, if followed by a hot July, *bellargus* is out early. Then the late specimens of *corydon* might just be captured with the early specimens of *bellargus*. It occurs now and again, but most entomologists know very well it is not normal. For example, this year *bellargus* was out on June 22nd; *corydon* will be out in a week, fully by the 1st of August, and *passé* long before the 15th or 20th of the month. Will *bellargus* be out then? From my experience and notes I think the chances are greatly against any being out; a few, however, may be. It is never out fully till the 24th to 28th of August. Strangely enough, my experience has been obtained chiefly in Kent, Sussex, and the Isle of Wight. If Mr. Sabine were to make written notes for a few years the comparison might be useful; but, although Mr. Sabine is "astounded," Mr. South and the "entomologists of much experience" are right, and Mr. Sabine is wrong, in concluding that these species normally fly together.

Blackheath, S.E., July, 1887.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

ABUNDANCE OF DIURNI IN THE MIDLANDS.—On June 25th I met with *Leucophasia sinapis* in abundance in North Worcester-shire, and, notwithstanding the lateness of the season, they appeared to be in very fair condition. A friend also reports the occurrence of this insect from Stourbridge. *Euchloë cardamines* has appeared in great abundance over the whole of North Warwickshire during the present summer. On July 11th I visited a locality in South Shropshire, and met with *Argynnis adippe* in the utmost profusion. I have never seen the like before; I might have captured hundreds had I desired to do so. For several years past *Vanessa urticæ* has been comparatively scarce throughout the midlands, but this year will, I think, prove an exception, judging from what I have seen so far. At Tintern, Monmouthshire, in June last, I found many broods of this insect. On June 21st, among many other insects, I took *Lycæna minima*, *L. astrarche*, and a pair of *C. porcellus* at Cheddar, North Somersetshire.—HARCOURT BATH; Ladywood, Birmingham.

ENTOM.—AUGUST, 1887.

2 E.

ZYGENA MINOS IN WALES.—A few weeks since I received several specimens of *Z. minos*, taken by a friend at the village of Abersoch, on the north-west coast of Wales, on the 8th of June last. As I have not heard of the previous occurrence of this insect in England or Wales, I have thought it worth recording, and shall be glad to hear if any of your correspondents have taken it. My friend informs me that there were some hundreds of the insect on one small plot of ground, but, not being a collector himself, he only secured a few specimens, more for the sake of information concerning the species than for any other purpose.—L. L. SAMUELS; Victoria Park, Manchester, July 12.

CIRRHÆDIA XERAMPELINA IN NORTH WARWICKSHIRE.—Mr. Stanley P. Jones's note (Entom. xix. 253), relating to the occurrence of this insect near Welshpool, reminds me that I captured a specimen of the same species at rest on an ash tree in a lane between Coleshill and Maxstoke Abbey, in August of last year. I believe this is the first recorded occurrence of *Cirrhædia xerampelina* in the Tame Valley district. There are undoubtedly many other good insects awaiting discovery in North Warwickshire, which have been overlooked by our older lepidopterists.—W. HARCOURT BATH; Birmingham, November, 1886.

DIANTHÆCIA LARVÆ CANNIBALS.—Last year Mr. Carrington kindly gave us a short article on breeding *Eupitheciæ*, and amongst other things stated what good results might be produced from gathering the flower-heads of *Silene inflata*. Last season, having obtained a quantity of the flower-heads of both *Silene inflata* and *S. nutans*, thinking to preserve them from getting too dry I turned the lot into a large biscuit tin; the result being that the flower-heads soon went mouldy from the confined damp, and a fine batch of miscellaneous larvæ were all killed. This year, after collecting the flower-heads, I shot them, just as they were, into a linen pillow-slip, putting a few fresh heads in every ten days or so as the others dried up. So far the result is eminently satisfactory, as I have obtained a good many pupæ already, both of *Eupitheciæ* and *Dianthæciæ* (probably chiefly *D. capsicola*), and should have had more, but for the real object of this communication, which is to warn anyone trying this plan to keep a good look out about the time the larvæ are turning and to remove the pupæ, otherwise if the *Silene* gets dry

the *Dianthæciæ* larvæ, of which there are certain to be several, will inevitably devour the freshly-turned pupæ in preference to their proper pabulum.—T. W. HALL; New Inn, London, W.C., July, 1887.

AMPHIDASYD BETULARIA.—Apropos of Mr. Hall's enquiry (Entom. 182) respecting *A. betularia*, although not exactly to Mr. A. E. Hall's point, yet it may be of interest to hear that the type still occurs in this district, as my brother captured a perfectly normal insect of this species on the night of June 14th by gaslight.—C. E. STOTT; Lostock, Bolton, July 18, 1887.

BUPALUS PINIARIA IN LONDON.—On the 8th inst. I found on one of the windows of the Imperial Bank in Lothbury, in the City of London, a female *B. piniaria*, a curious place for such an insect.—F. G. WHITTLE; 2, Cambridge Terrace, Lupus Street, S.W., July 7, 1887.

LOBOPHORA VIRETATA.—In reply to the Rev. Chas. F. Thornewill (Entom. 182), allow me to inform the readers of the 'Entomologist' that the fact of holly being the pabulum of *Lobophora viretata* in Sutton Park was known to several members of the Birmingham Naturalists' Field Club some years ago, and I daresay he will find a note of it in some magazine if he will refer back.—W. HARCOURT BATH; Ladywood, Birmingham.

NOTES ON LARVÆ OF PLATYPTILIA GONODACTYLA.—I obtained a large number of the larvæ of this species feeding in *Tussilago farfara* (coltsfoot) about three weeks ago. The larva, which has in its earlier stages a very curious Tortrix-like form, wriggles up and down the peduncle or flower-stalk. I have watched the larva very closely, and have come to the decided conclusion that it does not feed either *on* or *in* the seed-heads, but that it feeds on the soft cellular tissue inside the peduncle. During its very early stage it lives inside the flower-stalk, never coming out; but as it gets larger it finds its way up into the hollow receptacle which forms the base of the capitulum. When this gets too small it gnaws a little hole through the receptacle, and constructs a little home for itself made up of the achenes, with the attached pappus spun together with silk, directly above the hole. The larva, living in this, descends when feeding through the hole, and gradually clears out all the cellular tissue below; but that it does not feed *on the achenes* I feel convinced. No doubt the

peculiar domicile it constructs has led to the probably erroneous opinion that the larva feeds there. An infested flower-head can easily be recognised by the peculiar bunch forming this house standing isolated on the stalk, whilst the surrounding achenes have been blown away. It is a mistake, too, to think that the infested heads generally hang over; a few do so, undoubtedly. This, I think, is due to the larva, when feeding inside, clearing out too much of the cellular tissue on one side, and eating through to the epidermal tissue, which contracts, and hence pulls down the capitulum; but in nine cases out of ten the infested heads are more upright than the uninfested ones. I may add that the larvæ seem to choose few but the strongest heads. I have already bred imagines from larvæ found on May 13th, the pupal stage only lasting from May 21st to June 5th. I should like to know whether any entomologist has ever observed the larva actually eating the achenes or pappus.—J. W. TUTT; Rayleigh Villa, Westcombe Park, S.E., June 6, 1887.

EPHESTIA KÜHNIELLA IN LONDON.—At the meeting of the South London Entomological Society, June 9th, Mr. T. D. A. Cockerell exhibited a number of larvæ feeding in flour, which were obtained from a cargo lying, I believe, in the London Docks, the cargo being partly spoiled by the larvæ. He kindly gave me a number of them, and during the month (July) imagines have been coming out, the species being, as was suggested at the meeting, *Ephestia kühniella*. That they would soon establish themselves and become a great pest can readily be believed. I have now very small larvæ, pupæ, and imagines, and should think that they were *consecutively* brooded, the ova hatching soon after being laid, the larvæ feeding up and changing to pupæ all the year round. The larvæ want great care to keep them limited to a small space. I placed those I have in an apparently tight-fitting tin canister, but some of the larvæ managed to crawl out of the small spaces where the lid did not quite touch the sides of the box. This migratory propensity does not seem to occur until the larvæ are full-fed, when they leave their food to spin a small silken cocoon. The confined larvæ, I find, mix up particles of flour in the cocoon, but they want some loose substance to spin up in, as otherwise they seem to die off after having formed their *cocoon*. From an economic point of view this species is a very *undesirable* addition to our fauna.—J. W. TUTT.

ECOPHORA UNITELLA.—I have bred seventeen of these insects from dull sooty-coloured larvæ, found at Easter under the bark of old elm posts used in the construction of a rough fence by the side of the road leading from Walthamstow to Chingford. I brought home a few pieces of the bark about five inches long, which I laid on some fine earth in a pan, put a glass ring over it, and covered the top with gauze. They took readily to their new habitation, and I saw nothing more of the larvæ, every one of which, I believe, produced a moth, proving it to be an insect easy to rear.—WILLIAM MACHIN; 29, Carlton Road, Carlton Square, E., July 19, 1887.

LEPIDOPTERA AT DEAL.—The recent hot weather has put matters quite straight, and insects are just now appearing quite to date. A journey to Deal, from Friday to Monday last (July 1st to 4th), resulted in a nice lot of *Acidalia ochrata* (many just emerged, with their wings not fully expanded), a fine series of *Xylophasia sublustris*, *Agrotis corticea*, *Homæosoma sinuella*, *Anerastia lotella*, *Gelechia pictella*, and the usual sand-hill species, *Lithosia pygmæola*, being apparently well out. I am pleased to add *Mamestra albicolon* to the local fauna of the district. *Neura reticulata* (*sapponariæ*) also occurred. I do not know whether this has been recorded from the district previously. I found *Leucania littoralis* flying over the marram grass. The *Gelechias* that I wrote about in the early part of the year are just beginning to appear again, and remain a puzzle yet, although Messrs. Stainton, C. G. Barrett and others have given me every possible help. Probably we shall be able to clear up the matter this year. Insects (Micros particularly) were so abundant each evening, from about seven o'clock until dusk, that I was sometimes puzzled what to take first.—J. W. TUTT; Rayleigh Villa, Westcombe Park, S.E.

AGRION PULCHELLUM.—In communicating the following note my sole desire is to obtain information whether there are several varieties of this pretty little species of dragonfly, or whether I am confusing what are in reality more than one species together, so that I must ask indulgence for any mistake on a subject of which I know so little. (A.) By far the prettiest, to my thinking, and certainly by far the commonest, is the male of the following description:—Body turquoise-blue, banded with black; head likewise turquoise-blue and black; this type far outnumber all other

varieties put together, and is one with which I have been familiar all my life. (B.) Body black, banded with turquoise-blue; head likewise turquoise-blue and black; this is not a type with which I am familiar; female; single specimen taken by me in Wanstead Park in the afternoon of June 28th. (C.) Body dusky, banded with creamy rings; head likewise dusky; female; I have observed this type all my life. (D.) Body dusky, banded with creamy rings, like the female, with the exception of the last segment, which is turquoise-blue and black; head turquoise-blue and black; male?; I have noticed this type during more than one season; whether variety or distinct species, it is constant. (E.) Body dark grey, with the exception of the last segment, which is turquoise-blue and black; head also dark; eyes of dark coral-red, not turquoise-blue, as in the case of the other types; male presumably; two specimens from Wanstead Park. Type A, extremely common; C and D, fair number; B and E, rare.—F. A. WALKER; Dun Mallard, Cricklewood, N.W., June 28, 1887.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. — *July 6th, 1887.* Dr. D. Sharp, F.Z.S., President, in the chair. The Rev. W. T. H. Newman, M.A., 11, Park Terrace, The Crescent, Oxford, was elected a Fellow of the Society. Mr. M'Lachlan remarked that at the meeting of the Society in October, 1886, he exhibited a quantity of the so-called "jumping seeds" from Mexico, containing larvæ of *Carpocapsa saltitans*, Westw. The seeds had long ceased to "jump," which proved that the larvæ were either dead, had become quiescent, or had pupated; about a fortnight ago he opened one of the seeds, and found therein a living pupa. On the 4th inst. a moth (exhibited) was produced. The President, on behalf of the Rev. H. S. Gorham, exhibited the following Coleoptera, lately taken in the New Forest:—*Anoplodera sexguttata*, Fab., wholly black variety; *Grammoptera analis*, Fab.; *Colydium elongatum*, Fab.; and a specimen of *Tachinus elongatus*, Gyll., with brownish-red elytra. Mr. S. Stevens exhibited a specimen of *Orsodacna humeralis*, Latr. (*lineola*, Panz., var.), taken by him at Norwood: he also exhibited a specimen of the same beetle taken by him fifty years ago in Coombe Wood; during the

interval he had never seen it alive. Mr. G. T. Porritt exhibited, on behalf of Mr. N. F. Dobrée, of Beverley, a series of about thirty specimens of a *Tæniocampa* he had received from Hampshire, which had previously been referred to as a red form of *T. gracilis*. Mr. Dobrée was inclined to think that they were not that species, but *T. stabilis*. Mr. A. C. Horner exhibited the following species of Coleoptera from the neighbourhood of Tonbridge:—*Compsochilus palpalis*, Esp. (5); *Acrognathus mandibularis*, Gyll. (4); *Homalota atrata*, Mann., *H. vilis*, Er., and *H. difficilis*, Bris.; *Calodera rubens*, Er.; and *Oxytelus fulvipes*, Er. He also exhibited a *Rhizophagus* from Sherwood Forest, which appeared to belong to a new species; and several specimens of *Holopedina polypori*, Först., also from Sherwood Forest, where he had found it in company with, and probably parasitic on, *Cis vestitus*. Mr. Elisha exhibited two larvæ of *Zelleria hepariella*, Stn. Mr. Stainton remarked that as the greater part of the larvæ of *Zelleria* were attached to the Oleaceæ, it seemed strange that certain species had recently been found on Saxifrage. Mr. Slater read a paper "On the presence of Tannin in certain Insects, and its influence on their colours." He mentioned the facts that tannin was certainly present in the tissues of the leaf-, wood-, and bark-eating species, but not in the tissues of the carnivorous beetles, and that black-colour on the elytra of certain beetles appeared to be produced by the action of iron on tannin. A discussion ensued, in which Prof. Meldola, Mr. Poulton, Dr. Sharp, and others took part.—W. W. FOWLER, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—June 23rd, 1887. R. Adkin, Esq., F.E.S., President, in the chair. Mr. Wellman exhibited bred examples of *Lobophora viretata*, from Burton-on-Trent. Mr. Oldham, a number of species from Epping Forest, including *Drepana lacertinaria*, *D. falcataria*, *Notodonta dromedarius*, *Eurymene dolobraria*, and three specimens of *Chærocampa porcellus*, taken respectively at Theydon, Lords Bushes, and Loughton. Mr. Jager, *Erastria venustula*, from Horsham; bred examples of *Eupithecia isogrammaria*, *E. tenuiata*, and *E. venosata*, the last-mentioned having been two years in pupa. Mr. W. A. Pearce, *E. isogrammaria* and *E. castigata*. Mr. Sheldon, bred examples of *Sesia culiciformis*. Dr. Rendall, *Heliaca tenebrata*, taken at Hounslow. Mr. Turner, living larvæ of *Cucullia*

verbasci. Mr. West, of Greenwich, larvæ and cases of *Coleophora palliatella* and *C. currucipennella*, the former found on oak at West Wickham and the latter on oak, saw, and aspen. There were also a number of other interesting exhibits, among which were eggs of the Night-jar (*Caprimulgus europæus*), from Leith Hill, Surrey.

July 14th. — The President in the chair. Dr. Rendall exhibited *Acidalia rubiginata*, *A. marginipunctata*, *Eupithecia coronata*, *E. plumbeolata*, *Lithostegia griseata*, *Agrophila trabealis*, *Spilodes verticalis*, &c., all taken at Thetford. Mr. E. Joy, *Erastria venustula*, from Epping Forest. Mr. Wellman, *Dicranura furcula* and *Eupithecia togata*, from Perth. Mr. Jager, *Dicranura bifida*, &c. Mr. J. T. Williams, *Heliothis dipsacea*, *Hydrelia uncula*, &c., from Suffolk. Mr. Tugwell, four varieties of the larvæ of *Cucullia chamomillæ* ranging from white to pink, *Sesia sphegiformis*, and three specimens of *Dicranura bicuspis*, and two pupa-cases, one on the bark and the other on a twig of birch. Mr. Hall, *Spilosoma mendica* bred from ova. Mr. R. Adkin, *Notodonta trepida* (bred). Mr. Edwards, a variety of *Abraxas grossulariata*, the usual white ground-colour being powdered over, giving it a deep gray appearance, the orange markings in the superior wings being very distinct. Mr. Baron also exhibited a variety of *A. grossulariata*. Mr. South, some interesting forms of *Lycæna icarus* from the Isle of Wight, and called attention to a male with black spots on the hind wings, which he had only seen before in specimens from Sligo, Ireland. Mr. Billups, *Xylcopa violacea* and *X. latipes*; also *Taiscolia hæmorrhoidalis*, and read notes on his exhibit. Mr. Jenner Weir exhibited specimens of *Pieris oleracea*, from Hudson's Bay, and *P. napi*, and contributed some interesting remarks. Mr. Williams mentioned an instance of a species of wasp that had been observed to bring caterpillars into a room and put them in the opening of a reel of cotton fixed on a sewing-machine, the wasp afterwards closing the aperture. Mr. Billups observed that it was a well-known habit of the wasps to store caterpillars in openings which they closed up with mortar. Mr. Billups called attention to the fact, that in the neighbourhood of Essex Marshes the cabbages were utterly destroyed by the larvæ of *Pieris brassicæ*, which this season was very abundant.—H. W. BARKER, Hon. Sec.

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ON A NEW SPECIES OF *DIAPERIS* FROM JAPAN.

BY GEORGE LEWIS, F.L.S.

IN June, 1873, Mr. F. Bates described a species of *Diaperis* from Japan in the Ent. Mo. Mag., x. 14, and as at present I possess but one other species from these islands, I feel justified in describing it here because it may be a long time before the Japanese Heteromera, as a whole, will be worked out. At this time I possess over one hundred nondescript species.

Diaperis maculipennis, Marseul, cannot be left in *Diaperis*; it must become the type of a new genus, for which I suggest the name of *Derispia*. There are three species of it (which I shall shortly fully characterise) from Japan, and I have taken ten other species in Ceylon. I believe representatives of the genus are extremely numerous in Tropical Asia. Some are concolorous or nearly so, but the greater number are yellow with black markings.

DIAPERIS NIPONENSIS.

Oblonga, nigra nitida; thorace lateralibus subcanaliculato, stria marginali elevata. L. $9\frac{1}{2}$ — $10\frac{1}{2}$ mill.

Very similar to *D. boleti*, Linn.; head rugose and transversely depressed between the anterior portions of the eyes. Immediately behind the antennæ the margins are elevated, and between the antennæ is a medial raised part which is not sufficiently prominent to be called a tubercle. Thorax sparsely punctulate, with the lateral edges narrowly raised, the margins within are dilated and somewhat canaliculate. Each elytron has two transverse bands

and an apical spot reddish yellow. Basal band has four posterior denticulations at the 3, 5, 7, 9 interstices; posterior band has before and behind obtuse denticulations, which correspond roughly to the teeth of the anterior band. The apical spot is trigonal, with notches in the edge farthest from the apex of the elytron. The suture is black to the extent of the first interstice, and the elytral striæ and punctures do not present any specific characters, but resemble those in *boleti*, Linn., and *lewisi*, Bates. The prosternum is rather broad, without the definite lateral margination of *lewisi*, and it has a small medial tubercle at the anterior edge, which is evidently a continuation or culminating point of the anterior margin. In *lewisi* the space between the eyes is half the width of that in *niponensis*, and, roughly speaking, the same may be said of the prosternum. In *niponensis* the antennæ are broader, especially the apical joints.

The species is comparatively rare; I took it at Sapporo and Junsai in Yezo, and at Fukushima on the main island; but I obtained only twenty specimens altogether.

Since the date of Mr. Bates's paper *Diaperis lewisi* has been found in Siberia, and has been taken in all the Japanese Islands. The original specimens came from Fungi on some old posts on the bund at Nagasaki, and on the 30th June, 1880, I saw it in profusion at Shiba in Tokio under similar conditions.

Wimbledon, August 2, 1887.

ON A NEW SPECIES OF *PHELLOPSIS* FOUND IN JAPAN AND SIBERIA.

BY GEORGE LEWIS, F.L.S.

SEVERAL species of *Nosoderma* have been described lately by Mr. Champion, and he has pointed out to me that in *Nosoderma* the last two joints of the antenna are connate, but in *Phellopsis* the last three joints are free and somewhat lax. This seems a sufficient character for a generic distinction, although in the Munich Catalogue the species are all included in *Nosoderma*. Most of the species of *Nosoderma* have been found in Mexico and Central America, while those of *Phellopsis* are two from the United States, and the present species from the western side of the Pacific.

PHELLOPSIS SUBEREA.

Elongata, parallela, opaca, squamosa; thorace postice contracto; elytris posticis 6-tuberculatis. L. 19-21 mill.

Head: broadly and roughly marginate in front, the margin being divided into three parts by an elevation on each side over the basal joint of the antennæ; the central area is occupied more or less with small black tubercles, or little boss-like elevations. Thorax: has two rather acuminate tubercles over the neck, and the medial portion behind the tubercles has irregular ridges and depressions; the sides anteriorly are rather elevated and distinctly dilated, with the angles a little produced and obtuse; from the middle of the lateral ridge the thorax is posteriorly narrowed, and the basal line is the width of the bases of the elytra, on which it encroaches somewhat, especially before the region of the scutellum. Scutellum is small. Elytra: on each side of the suture before the tubercles are two rows of large ill-defined elongate punctures, with somewhat raised interstices; between the tubercles and the apex of the elytron the suture is margined with a row of black tubercles, which resemble those on the thorax. Before the apex of each elytron are two well-defined tubercles, which are transversely placed and touch each other at their base. The innermost tubercle is connected with the base of the elytron by an elevated ridge (often more defined in some specimens than in others), and parallel to this ridge is a shorter ridge, which is abbreviated before and behind. Between the two tubercles described and the apex of the elytron is a third conspicuous tubercle. The whole of the upper surface of the body is more or less clothed with small brownish scales (elongate under the microscope), many of which are lost by abrasion during the active life of the insect. The antennæ are moniliform, the 9th and 10th joints being slightly compressed and trigonate, and the 11th, as stated above, free. In general form and sculpture this species very much resembles others, especially *Phellopsis obcordata*, Leconte, and *Nosoderma venustum*, Champion, and some allowance must be made in reading this description, as the superficial structure varies a little in different individuals.

This species is perhaps diurnal in the early summer, as I first found it actively crawling on old trees which had been split by electricity at Chiuzenji, lat. $36\frac{1}{2}^{\circ}$, on the 10th June, 1880; but in

the warmer latitude of 32° , where summer commences much earlier, eight or nine specimens were found at Yuyama, 11th May, 1881, resting in the crevices of the bark on a prostrate oak, and in this position, owing to their subereous form and colour, they were very difficult to see; so much so, indeed, that although the specimens were clustered together they were only detected one by one at intervals. A keen native collector and myself were bending over the trunk in the eager excitement of capturing a curious and somewhat rare species, yet we failed to see them at once, although our fingers each time a specimen was taken must have almost touched its fellow left behind. In the position described, which may or may not be a usual one, the insects so closely resembled their environment that they were a perfect example of the phase of Natural History which is commonly called mimicry. I also obtained it at Sapporo, about lat. 42° , in August; and Mr. Pascoe has one from Siberia.

Wimbledon, August 10, 1887.

LYCÆNIDÆ IN NORTH KENT.

By RICHARD SOUTH, F.E.S.

IN his critical notice of my remarks on Mr. Sabine's varieties Mr. Tutt appears to have failed, either in grasping the point of my observations or in making himself acquainted with what actually wrote. One way or the other he has fallen into error. For instance, he says (Entom. 207), "The hybrid theory I consider is too far-fetched." Now if Mr. Tutt had read the whole paragraph wherein the word "hybrid" occurs, he would have found that not only wrote "hybrid or, perhaps more correctly, mongrel offspring of a union between *icarus* and *bellargus*," but that inclined to the mongrel view, and not to hybridism. To have entertained the latter, I must have admitted *icarus* and *bellargus* to be pure species, which I do not admit.

Lycæna icarus, *Polyommatus phlæas*, and *Thecla rubi* are probably all descended from a common ancestor; but I should not suppose a fertile crossing between *icarus* and either of the other species probable, or yet between *P. phlæas* and *T. rubi*. If any such intercourse did occur and there were issue, these would be hybrids. In the case of *L. icarus* and *L. bellargus* we have two

insects which, although they may be species, are not pure species in the sense that *L. icarus*, *P. phlœas*, and *T. rubi* compared one with the other are pure species. *Icarus* and *bellargus* exhibit superficial points of difference; but who shall say that during the process of slight external modifications which each has undergone, functional change in the internal conditions has also taken place to the extent of rendering fertile union impossible between these two insects. I can see nothing improbable in supposing that a female of either of the species may occasionally accept the amorous attentions of an importunate male of the other species.

This brings me to the second count in the charge I have against Mr. Tutt. He makes it appear that I have suggested that "*icarus* and *bellargus* copulate freely together in nature," whereas I consider such a thing quite accidental, as will be seen by referring to the words used, "chance crossing" (Entom. 81). If any remark of mine had warranted Mr. Tutt's inference, he would have been quite justified in characterising it as "more than improbable." As it is, he has placed upon my words a construction of his own, and to this I naturally take exception.

With regard to atavism, I may point out that I distinctly stated that I supposed the blue-black form among Mr. Sabine's varieties to be an instance of reversion to certain long-lost characters. Mr. Tutt appears to ignore this form altogether.

Mr. Tutt can hardly be serious when he asks me "to point out in nature anything at all compatible with (my) suggestion." Any other instance of a similar character would be open to the same objection as the one under discussion, and would be equally improbable to Mr. Tutt. In nature we lack the most important and convincing evidence—knowledge of actual parentage. In forming conclusions, therefore, we have to fall back on analogy, and we find many instances in the results obtained by experiments with animals in domestication or confinement which afford a clue, as it were, to the probable origin of such anomalous varieties as those of Mr. Sabine's.

Anyone who is interested in the subject of hybridism, will do well to carefully study Chapter IX. of Darwin's 'Origin of Species.'

12, Abbey Gardens, N.W., August 8, 1887.

LYCÆNIDÆ IN NORTH KENT.

BY E. SABINE.

PERMIT me to offer a few remarks in reference to some of the statements in Mr. Tutt's note (Entom. 207). I have nowhere stated that I found my pale *Lycæna* varieties "widely" distributed. I said "more" distributed; implying that whereas all the 1886 examples were taken within the space of a couple of acres (Entom. xix. 176), those captured this spring were found over a larger but by no means extensive area.

Whether they are identical with *icarus*-coloured *bellargus* Mr. Tutt mentioned I of course cannot say, not having seen such; nor do I think he has had sight of mine (otherwise he would surely have had something to say about them at the only time I have exhibited them), but mine differ on the upper surface quite as much from any *bellargus* I have ever seen as they do from *icarus*; on the underside (which in all the specimens presents a sort of washed-out appearance) the males have the markings of the former, but the females are most like specimens of the latter.

I still adhere to the hybrid theory, and if this be the correct one, it is simply absurd for Mr. Tutt to say that these varieties "fly only with the species of one parent (in this case *bellargus*"). Is he not aware that *icarus* occurs freely with both broods of *bellargus*? Indeed, last June we found one quite as numerous as the other.

As to the contemporaneity of *corydon* and *bellargus*, I should never have entered upon the subject at all (believing my experiences to be common property amongst entomologists) had it not been for the grave doubts cast on my statement, that I had taken these two species *in copulâ*, by gentlemen "of much experience."

My argument is simply this: that early specimens of the second brood of *bellargus* are to be found amongst the *corydon* in August, and late individuals of the latter occur when the former is abundant in September. Without neglecting Lepidoptera generally, I have yet devoted much time for years past to the *Diurni*, and profitably too, I think; and have been out and about every year, the whole season long, accompanied by one or other

of my boys, and we have naturally made not a few observations. I give those for the past seven years—it is not necessary to go back farther than this.

Visited my “particular spot” regularly in August each year, and always met with *bellargus* in more or less abundance from about the middle of that month; but this year, owing no doubt to the very exceptionally hot summer we have had, the first individual of the second brood of *bellargus* was netted on the very early date of August 8th. I need hardly say *corydon* is now out.

In the Septembers of the years 1881—5, inclusive, while sojourning at Folkestone and Dover, we never once failed to see *corydon* in few or more numbers flying with *bellargus*, in one instance so late as the 21st of the month.

Last September, on the 4th, and again on the 7th, dozens of *corydon* were still flying among the *bellargus*, the males mostly worn, but some of the females quite fresh in appearance.

I do not propose to write further on this matter, and would only suggest that observation alone will clear up the point. Theory, supported by no matter what argument, is of little use; and I feel sure that any one, having the time and caring to take the necessary trouble, will find that, in places where both species occur in profusion, *corydon* and *bellargus* are to be found flying together at some period or other of their career. Mr. Tutt is strongly against me, but I observe that he has “paid but little attention to the butterflies during the last five or six years!”

A word now as to his data. He writes, “For example, this year *bellargus* was out on June 22nd.” Really! I observe that in a previous communication he says of *bellargus*, “I did not see a specimen.” This was at Cuxton, and I presume he meant to imply that *bellargus* was not fully out there, or it may be elsewhere, until the 22nd of June. Now, if Mr. Tutt aspires to be an authority on the matter, I would recommend him to go further afield for his information. Had he been with us on June 6th (instead of at Cuxton), he would have found *bellargus* plentiful enough.* On the 21st of that month we noticed that it was much reduced in numbers, and that three-fourths of those still flying were worn.

In conclusion, I decline any further controversy whatever with Mr. Tutt on this subject, and most certainly it is not

* A few seen at Ventnor, June 4th, 1887.—R. S.

my intention to enlighten him as to the precise situation of my "particular spot," however much he would "like to know." I see no necessity for so doing, especially as, according to his account, these varieties are so well known and so "widely distributed."

The Villas, Erith, August 12, 1887.

NOTES FROM SHOEBOURNESS.

By W. G. SHELDON.

On the 24th of July I was in the neighbourhood of the above village, and having a few hours to spare I elected to spend them in working for Lepidoptera on the sand-hills and salt-marshes stretching along the coast to the north-east of that place; the same as mentioned by Mr. Carrington in his instructive article on salt-marsh collecting (Entom. 45).

The day was unfortunately not the most favourable for coast collecting, a strong wind blowing all the time; however, it was from the south-west, but still the smaller species especially did not seem to like flying in it.

On the sand-hills insects were common, but nothing of rarity turned up, *Lithosia complana* being perhaps the best; *Cledeobia angustalis* was of frequent occurrence, as also were *Crambus perlellus* and *C. warringtonellus*. I cannot but think that this latter insect is nothing more than a melanic variety of the former. They generally occur in the same locality and at the same time, and intermediate forms are frequent; in fact my series of each of these species is graduated, and it is difficult to form an opinion where one ends and the other begins. The flowers of the marram grass at dusk were covered with the usual sand-hill Noctuæ—*Agrotis tritici*, *A. nigricans*, and *A. velligera*, with a sprinkling of *Caradrina blanda*, *C. alsines*, &c.

On the salt-marshes one or two species occurred in great abundance: most noticeable were *Catoptria candidulana* amongst the fragrant *Artemisia maritima*; *Eupœcilia affinitana* and *E. vectisana* generally. A few worn specimens of *Eupithecia subnotata* were disturbed from *Chenopodium*; also one *Crambus salinellus*. A few *Agdistes bennetii* were flying at dusk, but they

were in too dilapidated a condition to be worth taking. Traces of the larvæ of *Bombyx castrensis* were apparent on *Artemisia*, and no doubt earlier in the season they had been common. I did not see any sign of *Geometra smaragdaria*.

Mr. Carrington raises the interesting question, "What becomes of the Lepidoptera when the salt-marshes are covered with the tide?" Something I observed may possibly throw some light on this problem. I had found a particular spot on the marsh where the two Eupœciliæ were common: it was a sort of bank sloping towards a pool left by the tide; the wind was blowing briskly from the bank to the pool, and as I disturbed the insects it carried them over it; presently I observed one on the surface, and stooping to pick it up was much surprised to find it rise off the water with perfect ease and fly away. I soon observed others in the same position, and presently saw several settle and (after remaining apparently immersed for some time) fly away. I then found that insects of the orders Hemiptera and Diptera had the same power as the Lepidoptera, and that they floated on the water and rose from it without difficulty. It seems, therefore, possible that insects frequenting these marshes have acquired a kind of floating apparatus which enables them to rest securely on the face of the waters whilst their haunts are covered by the tide.

Rose Cottage, Oval Road, Addiscombe, August 13, 1887.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

DIURNI IN HAMPSHIRE.—On the 25th July I saw three fine specimens of *Vanessa polychloros* near Newport, Isle of Wight; but, having no net, was unable to secure them. Three days later I returned and caught in the same place three specimens, probably those I had seen. I paid one visit to the New Forest, near Lyndhurst, and took five *Limenitis sibylla*, numbers of *Lycæna ægon*, and many *Hesperia comma*. This was on the 2nd August.—HARRY C. SANDFORD; Royal Military Academy, Woolwich, August 3, 1887.

DIURNI ABUNDANT AT DEAL.—Many species of Diurni seem to be abnormally abundant in this district this year. The double-brooded species seem to be exceptionally so. The

following notes, referring only to the immediate district around Deal (unless otherwise mentioned), may be of interest. The second broods of *Pieris rapæ* and *P. brassicæ* are occurring here in the utmost profusion; they are to be met with in immense quantities everywhere, and it is amusing to watch the numbers congregate around the smallest puddle of water, where one by any accident has been formed. The second brood of *P. napi* is very abundant by the sides of the ditches all over the district; I found very dilapidated specimens of the early brood on July 3rd, and a fine large specimen of the second brood on July 23rd. This would seem to be a "white" year here, if the "whites" were not more than outnumbered by certain "blues." I have never noticed them so large or so numerous before. *Lycæna icarus* is beyond doubt the insect of the season, as far as this district is concerned. The second brood is occurring on the sand-hills here in incredible numbers; they are literally in thousands, and on one small clump of marram, about three yards square, within a dozen yards of the sea, I counted above 200 specimens, and this was only one of an endless number of such clumps. This is the more remarkable as the early brood seemed more scarce than usual. It is also abundant on the Downs, and at Kingsdown it is occurring in large numbers. In the town it may be seen, wherever there is an attempt to form a garden, in company with *P. phlæas*, attacking the "whites" in the most pugnacious manner. *L. astrarche* occurs on the sand-hills with *L. icarus* in almost equal abundance. The second brood was beginning to appear on July 24th, and it now abounds not only on the sand-hills, but also on the undercliff between Kingsdown and St. Margaret's Bay. This species and *icarus* are also occurring in unusually large numbers around Folkestone. I noticed scarcely any specimens of the spring brood. I saw wasted specimens of the first brood of *Lycæna minima* on July 11th near the South Foreland. The second brood put in an appearance on August 5th at Kingsdown, and is now occurring in larger numbers than one generally sees this partially double-brooded species in the autumn. A specimen of the second brood of *L. argiolus* was seen in the Dover Road, Folkestone, on August 8th; others had been seen the previous week. *Vanessa urticæ* is as abundant as usual. *V. atalanta* not yet out; larvæ and pupæ fairly abundant. The second brood of *Pararge*

megera is following the general rule of the double-brooded species this season, being everywhere abundant. *Polyommatus phleas* occurs everywhere here with *L. icarus* and *L. astrarche*; very abundant, although not in such profusion as the two other *Lycænidæ*; it occurs frequently in the gardens and streets. *Melanargia galatæa* in greater abundance this year, both at Kingsdown and on the Dover cliffs, than it has been for many years; still out in good condition, some females apparently emerged yesterday (August 9th). I have not seen a specimen of *Vanessa (Cynthia) cardui* here this year; for the last five years it has literally swarmed about the town, and on the cliffs at Kingsdown; I cannot find larvæ. A wave of immigrants of this species this year has undoubtedly *not* reached our shores. Of *Colias edusa* and *C. hyale* not a specimen; I was told that one of the former was seen at Folkestone on Friday last. *Argynnis aglaia* seems unusually scarce this year; I have only seen two specimens all the summer. *Lycæna corydon* fairly abundant on the cliffs around the South Foreland, but not in such numbers as I have previously seen it; only two specimens were seen at Kingsdown, where a few years ago the species was abundant. Most of the double-brooded moths are out, and in some numbers. *Melanippe galiata* was flying freely last evening, and many were worn. *Zonosoma punctaria*, *Timandra amataria*, and *Acidalia ornata* were taken on the cliffs at Kingsdown yesterday. *Acidalia rusticata* was, as usual, there. Is the natural food-plant of this species known yet? I feel certain it is *Parietaria officinalis* (wall pellitory), although I cannot prove it to be so.—J. W. TUTT; 3, Park Street, Deal, August 10, 1887.

ABUNDANCE OF PIERIDÆ IN SOMERSETSHIRE.—This season has as yet brought forth (as far as I am aware) few specimens new to the locality, but two or three species at all times notably common have turned up in unusually great numbers this year, viz., *Pieris rapæ*, *P. brassicæ*, *Vanessa urticæ*. *Pieris rapæ* and *P. brassicæ* have been frequently known to cross the sea in large numbers and disperse inland, and, although I have heard of no such migration, their profusion lately in this district might easily be accounted for in this way. How can we account for the abundance of *Vanessa urticæ*, of which there are no such records? May not the unusual heat have something to do with their large numbers? They would increase incredibly in ordinary years

were it not for the ravages of ichneumons. On experimenting with these flies I found that if exposed to any unusual heat from the sun they speedily died. If this be the case in nature (which I see no reason to doubt), and as we have had an unusually hot summer, it is probable large numbers would die off, and consequently a larger percentage of larvæ would escape unstung, and the butterflies emerge from their chrysalids. It is to be hoped, however, the ichneumons will do their work doubly well next year, or the cabbage plants, on which the Pieridæ feed, will stand a poor chance of arriving to any perfection.—W. G. McMURTRIE; South Hill, Radstock, July 29, 1887.

NOTE ON ARGYNNIS PAPHIA.—One morning, at the beginning of August, I saw a specimen, apparently in good condition, of *Argynnis paphia*, flying about the pier at Worthing. Is not this rather an unusual situation for this wood-frequenting insect?—JOSEPH ANDERSON, Jun.; Chichester.

VANESSA ANTIOPA.—I have read with interest the notes which have been published from time to time in the 'Entomologist' on the colour of the outer borders of the wings of this butterfly, and thought that a few words on the subject from this side of the ocean might be of interest. I have been perfectly familiar with this insect for more than forty-five years, for during that time it has been on the average one of the most common, if not *the* most common butterfly in the localities where I have lived. For the last sixteen years I have had classes in Entomology, and naturally my attention has been directed, year after year, to this very common butterfly, in all its stages, by the different students under my tuition. There is but one generation in a year, and the butterflies hybernate during the winter, in the imago stage. They appear on the wing in the warm spring months, and the females deposit their eggs in May, sometimes to the number of 125, in a belt around the twigs of elm or willow. The eggs hatch, the larvæ pass their transformations, and the butterflies emerge during the latter part of July. These summer insects, fresh from pupæ, *always* have yellow borders, while those which have lived over the winter *always* have the whitish or faded borders, and I have never seen nor heard of an exception to this. They vary considerably in size, but I have never seen any very great variation in coloration except that referred to on the borders

of the wings, which is simply a case of fading with age and exposure. If, therefore, in this country those with the yellow borders are always fresh from the pupæ, and those with faded or white borders are always old or hibernated specimens, is not the same thing true in England and also on the Continent? — C. H. FERNALD; Amherst, Mass., U.S.A., August, 1887.

LYCENA ASTRARCHE AT NEWBURY.—I have taken several specimens of this butterfly near here this season. I report this as Newman says it does not occur in lists transmitted from Berkshire. It is the first time I have taken it in this county.—(Miss) M. KIMBER; Cope Hall, near Newbury.

LYCENA CORYDON NEAR HOUNSLOW.—On August 1st I was surprised to take, at the place above mentioned, a fine male specimen of this insect at privet bloom, in company with *Polyommatus phleas* and *Lycæna icarus*. The insect was observed "toying" with one of the common blues, and before it was netted attention was drawn to it on account of its larger size and lighter colouring. I was unaware the *L. corydon* was taken except on the chalk, and have since had the advantage of consulting with Mr. South on the subject, and he tells me that that is also his experience in collecting that blue. I was sufficiently interested in my capture to investigate the geological formation of that neighbourhood; with this object I visited the Royal School of Mines, and studied the soils of Middlesex and the surrounding counties, with the following result:—On the north, there are two tongue-like processes coming from Bucks, in the neighbourhood of Chalfont St. Peter and Rickmansworth. On the west, there is none to be found nearer than Windsor; and even there, though there is a subsoil of chalk, it nowhere appears on the surface, save in the neighbourhood of the castle. On the south, Banstead Downs is the nearest spot where that particular soil prevails. All three are equidistant, for all practical purposes, from the town in question. The brilliant colouring and perfect state of the cilia render it highly improbable that it could have compassed so long a flight as would have been necessary had it migrated. I have, however, purposely gone into detail on the subject, as I deemed it possible that anyone, not having seen the specimen in question, might have suggested that theory for its appearance on a gravel soil.—PERCY RENDALL; 16, Little Grosvenor Street, W.

LYCÆNA CORYDON AT BECKENHAM.—On August 6th I took a male specimen of the above in our garden. Is it often taken so near London?—A. M. REID; The Avenue, Beckenham.

SPHINX CONVULVULI IN ESSEX.—I think it may be of interest to know that I took a fine male *Sphinx convolvuli* here over a bed of petunias last night (8th inst.), and saw, a day or two ago, *Macroglossa stellatarum* in the same place. I may add that we are only seven miles out of London.—A. E. TONGE; Limefield, Ilford Park, Essex, August 9, 1887.

SPHINX CONVULVULI AT WINDSOR.—On Monday, August 22nd, in the early part of the morning, I captured a male *Sphinx convolvuli*. Half an hour later a boy brought me a fine female, which he had caught in his cap not twenty yards distant from where I obtained the male. Both specimens were on the wing. Is not this very early?—ALBERTO EDMONDS; 3, Park Street, Windsor, Aug. 20, 1887.

SPHINX CONVULVULI IN FRANCE.—Whilst staying in Etretat, a small village on the Normandy coast, I have been enabled, in conjunction with my brother, to take twenty-five of these magnificent insects. On the 18th inst. I was in the garden about eight o'clock, when I chanced to look across to a large bed of petunias, which seemed almost alive with them. I netted on that night seven specimens only, but on the next night I was able to take eighteen: they were all, with one exception, quite fresh and very good specimens. Is not this a wonderfully large take?—NIEL H. REID; Beckenham, Kent.

CALLIMORPHA HERA AT EXETER.—I write to mention the occurrence of this rare moth in this neighbourhood. Its capture near Starcross on the other side of the Exe, about eight miles from this as the crow flies, has been recorded in your columns during the two preceding seasons; but when I went out to try my fortune yesterday I had no expectation of meeting with anything so rare. The specimen I took was perfect, but slightly faded in the rich colour of the under wings, at least as compared with those I have noticed abroad. Its size, however, is fully up to that of Swiss specimens. There seems to be a very interesting entomological fauna in this part of South Devon, judging from a local collection I have had the pleasure of examining; and I hope
a notice of the insects worthy of record, which I have met

with hereabouts, at an early date.—W. F. DE V. KANE ; Winslade, Exeter, August 16, 1887.

PUPATION OF COSSUS.—Whilst some lawn-tennis was going on here a short time ago one of the party actually saw the perfect insect of *Cossus ligniperda* emerge from the ground within the Court. I doubted it for a moment, as I believed the larva always made up its pupa-case in the wood ; but on going to the spot I saw the pupa-case and the moth in a perfect condition.—W. O. HAMMOND ; St. Alban's Court, August 22, 1887.

DIANTHÆCIA CAPSOPHILA FEEDING ON CARNATIONS.—I was rather startled yesterday evening by the information that a lady resident in this locality desired my opinion as to the destruction of all her beautiful carnations and pinks by a nocturnal marauder that devoured the buds just as they were about to burst into bloom, a circumstance that had not previously occurred during a residence of some years at the seaside. I confess that, with my very elementary knowledge of the larval stage of insect-life, I felt much as the king of Israel is recorded to have felt when the Syrian general came to be cleansed of his leprosy ; I cast about in my mind as to how I could avoid hazarding an opinion until I could consult Mr. Kane or some other eminent entomological friend ; but what was my astonishment and joy to observe, upon inspecting the carnation-buds sent, a nearly full-fed larva of *D. capsophila* looking at me from a round hole which he had pierced in the top of the bud. As an old friend, so I recognised him at once. Your readers are doubtless aware that *D. capsophila* is found abundantly upon this coast, the imago flying at dusk over the flowers, and the larvæ feeding at night upon the capsules of *Silene maritima*, which is usually quite a common plant upon the shores of Howth. This year, from the abnormal heat of the weather, the plant has become rare ; hardly a flower of it is to be seen, and therefore it seems to me most strange, and yet most natural, to find this larva adopting what lawyers would call the "cy-pres" doctrine, and seeking to sustain life by feeding upon another member of the botanical order of Caryophyllaceæ. The two plants are most unlike to the casual human observer. — S. R. FETHERSTONHAUGH ; Rokeby, Howth, Co. Dublin, July 30, 1887. [Larvæ of *Dianthæcia capsicola* are not uncommon in seed-capsules of sweet-williams and pinks in London gardens.—B. S.]

AMPHIDASYS BETULARIA.—With reference to Mr. Hall's enquiry (Entom. 182), I may say that every specimen of this moth which I have bred has been of the black variety; but three years ago I took a single specimen of the normal form, which is the only one I have met with.—R. H. THOMPSON; 50, Parsonage Road, Withington, Manchester, July 30, 1887.

STRENIA CLATHRATA AT SLOUGH.—I took a specimen of this insect on June 9th, and again another, quite fresh, on July 31st; a hot and dry summer produces two broods of some species. I should like to know if this has ever been known of *S. clathrata*, or are there successive emergences of this insect under certain atmospherical conditions?—J. SEYMOUR ST. JOHN; Chalfont St. Peter, Slough.

FOOD OF LOBOPHORA VIRETATA.—I should be sorry to question Mr. Harcourt Bath's statement (Entom. 211) that the fact of *L. viretata* feeding on the berries of the holly "was known to several members of the Birmingham Naturalists' Club some years ago." But, if so, they have been very cautious about imparting information to others. I made the enquiry (Entom. xix. 181) what was the connection between this insect and the holly? and to that enquiry the only answer given was by Mr. Harcourt Bath himself, on page 255 of the same volume, where he says, "This insect feeds on holly," but gives no evidence, either from his own observation or from any other source, to prove his statement. It happens also that, when your August number reached me, I was in the company of Mr. G. Blatch, a well-known Birmingham entomologist, and he distinctly assured me that neither he nor Dr. Warwick Jordan—whom I believe Mr. Harcourt Bath would acknowledge to be an authority on such matters—had any previous knowledge of the fact stated by me in your columns this year. I think therefore that it is only fair to ask Mr. Harcourt Bath for the names of (say) two members of the Birmingham Naturalists' Club who "knew" that holly was the food-plant of *L. viretata*; or, if he objects to give them, the name of the magazine (referred to by Mr. Bath as "some magazine") in which the record of their observations is to be found. I do not care in the least whether I or some previous observer can claim the credit of the discovery, but I do think that in a publication like the 'Entomologist' we ought to have

ascertained facts whenever possible, and not mere surmises, however great may be the authority on which they are put forward.—CHAS. F. THORNEWILL; The Soho, Burton-on-Trent, August 13, 1887.

GEOMETERS TWO YEARS IN PUPA. — I have this month had *Cidaria sagittata* and *Eupithecia venosata* emerge from pupæ obtained in the autumn of 1885. The bulk of the broods of both species appeared twelve months ago, June, 1886.—J. W. TUTT; June, 1887.

TINEOLA BISELLIELLA, LONGEVITY OF LARVA OF. — One thousand, one hundred and sixty-six days seems to me an unusual length of time for a larva of a clothes'-moth to be feeding. One which hatched July 3rd, 1884 (ova laid about 25th June, 1884), was on June 15th last about three-sixteenths of an inch long, and was spinning a web. Not thinking it full-fed I did not again examine it until July 28th last, when I was surprised to find the moth had emerged, and which flew away upon opening the test-tube in which the larva had been confined since it hatched, and fed upon a portion of a parrot's wing-feather until February 24th last, when I supplied it with a few sparrow's feathers.—F. W. FROHAWK; Balham, S.W., August 15, 1887.

LARVA OF HARPIPTERYX SCABRELLA.—I met with the larva of this pretty species rather commonly this year among the hawthorns in Epping Forest about the middle of June. Like all the *Cerostoma* larvæ that I am acquainted with they are excessively active, and require a close-fitting cage to keep them from escaping. They so closely resemble the larva of *H. horridella* as to be separated with difficulty; but that of the latter feeds on blackthorn, and is perhaps a shade paler. They appear to suffer little from ichneumons, and are comparatively easy to rear.—WILLIAM MACHIN; 29, Carlton Road, Carlton Square, E., August 19, 1887.

SIREX JUVENCUS NEAR MANCHESTER.—A fine female of this large sawfly was captured in Didsbury, near Manchester, two days ago. It was seen to fly into a room of a house through the open window and settle on the blind. The window was then closed and the insect boxed out of curiosity. It was handed to me alive this morning, and is a remarkably fine specimen. I have not heard of this species being taken in this district before.

and shall be glad to hear if any of your readers have taken it in this part of the country.—JAMES GÜNTHER; Oldham, August 18.

LEPIDOPTERA, &c., ROUND LONDON.—In Dr. Rendall's paper (Entom. 198) I see he draws attention to a subject which has interested me for some time past, viz., the disappearance of insects once common in the vicinity of the metropolis. Entomologists whose memory carries them back thirty years cannot fail to be struck with the present paucity of many species that once occurred abundantly round London; take, for instance, the best parts of Epping Forest, say Loughton and High Beech, and the contrast between thirty years ago and now will be at once apparent. When I first visited that locality, in 1858 or 1859, every bramble bush in bloom almost swarmed with common Diurni, such as *Epinephele tithonus*, &c., and the falling off in their numbers since then is almost startling; and this I quite agree with Dr. Rendall is owing to "sootilisation," and I think we may add the long continuance of cold summers until this year. I have not myself seen Lepidoptera so common since, as they were before, the celebrated wet summer of 1860, which, I believe, caused the extinction of several species in certain localities. I believe the east and north-east of London suffer most acutely from "sootilisation," the prevailing wind, taking the whole year round, being from the south-west; and in proof of this anyone has only to visit one of the large lakes in Wanstead Park and examine the north-east corner of it after a south-west wind, and the fuliginous scum he will find deposited thereon will soon convince of the reality and solidity of "sootilisation." This sooty deposit, which is so apparent on the water, must fall on vegetation in like manner, and no doubt has caused sad havoc with many species once common. Nearly all the lichen has gone from the trees in the Forest, and this, I believe, is another proof of the impurity of the atmosphere. Thirty years ago I used to take many common species of *Micros* on an old fence at Hackney, but you may go round the park palings here and never see so much as an insect of any kind. I have also, in common with Dr. Rendall, noticed in this neighbourhood the great scarcity of Lepidoptera round the street lamps. What has become of *Bombyx neustria*, once so great a pest on fruit trees and whitethorn hedges almost close to London? It have totally disappeared; and *Odonestis potatoaria* seems

to have shared its fate. *Vanessa io* seems also to have gone, and many other species I could name. The same remarks will also apply to some of our Coleoptera. I have not seen *Cetonia aurata* or *Melolontha vulgaris* for years, and I need hardly say how common they used to be; and where I have now lived for the past eight years I have never even seen a specimen of the common *Carabus violaceus*, which I used years ago to so often find smashed on the pavements in the mornings, having fallen a victim to some nocturnal "beetle-crusher." It would, I think, be very interesting to our younger entomologists if some of our veterans would from time to time give some account of the localities round London and what they used to produce. In conclusion, I may add that I think our greatest enemy is undoubtedly "sootilisation"; and as this extends in conjunction with building operations, &c., we shall have to go further afield to obtain the species which a few years ago a short walk in the country would have enabled us to collect.—C. J. BIGGS; 3, Stanley Terrace, West Ham Park, London, E.

LONDON LEPIDOPTERA.—Dr. Rendall's notes, in the last number of the 'Entomologist' (Entom. 198), have much interested me, as I have been in the habit of recording the species of Lepidoptera found in London for some years past. To the list given by him I am enabled to add a few. In 1869 I observed the common blue (*Lycæna icarus*) in several of the London squares, but have never seen it in the metropolis since. In 1879 or 1880, *Zeuzera pyrina* was extremely common in the squares; I had more than a dozen brought me found on tree trunks in Euston Square alone. When living at John Street, Bedford Row, a specimen of *Notodonta ziczac* once flew in through the open window attracted by the gaslight. The moth was a female, and commenced laying eggs soon after being captured, a good series having been bred from these the following year. To the list of Noctuæ may be added *Hadena trifolii* and *Caradrina quadripunctata*. I have seen also *Amphipyra pyramidea*, *A. trago-pogonis*, and *Mania maura* taken at sugar at Highbury. Amongst Geometræ I have occasionally seen *Crocallis elinguaris* in the parks. Of the Pyralidæ the most interesting capture is a specimen of *Spilodes sticticalis*, which was taken in Gray's Inn Gardens in 1880. Amongst the Tineinæ, *Hyponomeuta padellus* seems to be very common in London this year; and *Chrysoclysta linneella*

is of course well-known as a cockney moth. I forward this note with a view to its being of use to any entomologist who is contemplating the production of a complete list of metropolitan insects.—R. MELDOLA; 6, Brunswick Square, W.C., Aug. 4, 1887.

LEPIDOPTERA IN MONMOUTHSHIRE.—Having had three weeks' and a half collecting in Monmouthshire, I may say that I have found the latter part of July and the beginning of August a very favourable time there for insects. Among others, I was pleased at securing a long series of *Vanessa c-album*, which were very common in all parts, but especially near Tintern Abbey on the banks of the Wye. It occurred most frequently on the blackberry, disputing possession with *Argynnis paphia*, which was also one of the commonest species here. I took one peculiar variety of a male *paphia*, in which the black markings on the under side of one of the fore wings are run into one large blotch, extending from near the base to beyond the centre of the wing. I took *Argynnis adippe* and *A. aglaia* sparingly on sunny days between Usk and Chepstow, and in other parts. I notice that Newman gives Heullis Wood as the only locality in the county, but if looked for I have no doubt they would be found in many other parts. *Vanessa urticae* was one of the commonest butterflies everywhere; and in the middle of July I also saw the larva of *V. io*, and took the perfect insect fresh from the chrysalis a little later. *Melanarge galatea* appears to be rather scarce; I saw a few specimens in Went Wood, four miles from Usk. *Pararge egeria* and *P. megæra* were frequent, but not common; probably the second brood would not be out till a little later in the year. I secured a few specimens of *Epinephele ianira* with one or more wings bleached; all of these were females. *E. tithonus* and *E. hyperanthes* occurred in every part of Monmouthshire in great numbers; I took one variety of the latter insect in which the usual rings on the under side are reduced to four white points on each of the lower wings, and are quite absent from the fore wings. *Cænonympha pamphilus* was not uncommon; and I took specimens of *Polyommatus phlaeas*, and several of the genus *Lycæna*. I am not aware whether any varieties of the under side of *Lycæna icarus* have been noticed,* but among those I took some have no eye-spots at all on the fore wings between the discoidal spot and the base†; some have in this space two and others three eye-

* Entom. 75.

† Var. *icarinus*, Scriba.

spots; and one variety has two eye-spots on one wing, and only one on the other, the second spot being reduced to a pure white speck. The Hesperiidæ and commoner Pieridæ appeared as usual in large numbers; but I was struck with the preponderance of *Pieris napi*. I did very little moth collecting, and those taken were mostly of the commoner sorts. Among these were *Melanippe procellata*, *Acidalia emarginata*, *Cidaria dotata* (*pyraliata*), &c.; *Acipitilia pentadactyla* occurred in hundreds, and some other moths of that family were frequent; also several species of *Eupitheciæ*, which I am unable to name. Among Coleoptera, I took the larvæ, pupæ, and perfect insect of *Dorcus parallelipedus* in numbers from the stump of a decayed oak tree; *Strangalia armata* on brambles; and a species of *Harpalus* also in the above oak stump. *Lagria hirta* appeared everywhere; as also *Coccinella bipunctata*, *C. 7-punctata*, *C. 19-punctata*, *C. obliterata*, *C. 11-punctata*, *C. 5-punctata*, and *C. variabilis*. *C. 7-punctata* varied considerably in colour, from deep red to orange and pale yellow. I obtained a few Diptera, and among them the beautiful humble-bee fly.—CHARLES E. M. INCE; 11, St. Stephen's Avenue, Shepherd's Bush, London, W., August 13, 1887.

COLLECTING IN COLORADO.—After a day's journey from Denver I arrived here, at West Cliff in Custer County, on the evening of July 13th, and since then have experienced the mixed pleasure and bewilderment of coming into an entirely new country, with a varied and unfamiliar fauna. The district is an elevated valley, about 8000 feet above the sea-level, and surrounded by mountains; on one side the Sangre de Cisto range, and on the other the Wet Mountains. All orders of insects are abundant, but more especially Coleoptera and Hymenoptera. A red-brown *Pterostichus* is very abundant under stones and fallen timber; a *Necrophorus* like *ruspator*, a *Hister*, and a *Silpha* occur under dead bodies of animals; a *Clytus* of rather small size is frequent; and a fine green *Buprestis* was taken on my window. A large *Bombus* abounds, and with it a smaller species, and two species of *Vespa*. Ichneumons and ants are without number; and a pretty greenish blue *Chrysis*, not unlike *cyanea*, is common. The open prairie is covered with large stones and sparse vegetation, and produces a small black *Scarabæus* and a *Lygæus*, as well as plenty of small Coleoptera and Arachnida. Light is fairly successful as a means of capture, only it is rather spoilt by the

presence of innumerable specimens of one of the larger *Pyralideæ*, and a red-brown Ichneumon. Noctuæ are perhaps less numerous than in England; but there are plenty of Geometræ, including three or four green Geometridæ. A fine *Smerinthus*, allied very closely to *ocellatus*, but with greyer upper wings, flew in one evening; doubtless the larva had fed on the *Populus tremuloïdes*, which grows thickly by the door and all down Swift Creek. Grasshoppers (Locustidæ) are very abundant; and of many species, one kind, with a sooty-coloured thorax and upper wings, and under wings half black and half yellow, makes a loud clicking noise as it flies jerkily through the air. A curious case of what I suppose to be protective resemblance occurs in a species of *Tipula*, which has a black head and thorax and the anterior two-thirds of the abdomen red-brown, and the posterior third black, thus having the closest superficial resemblance to species of Ichneumonidæ, which are abundant in the same locality as the *Tipula*. The commonest species of Rhopalocera is *Colias eurytheme*, and with it *Pieris oleracea* and *P. protodice* occur in less numbers. *Anosia plexippus* flies by the road-side, *Vanessa antiopa* is frequent in damp places, and *V. milbertii* settles by muddy pools.—T. D. A. COCKERELL; West Cliff, Custer Co., Colorado, U.S.A., July 27, 1887.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*August 3rd, 1887.* Dr. D. Sharp, President, in the chair. Mr. John Witherington Peers, M.A., of Wendover, near Tring; and Mr. R. G. Lynam, of the North Staffordshire Infirmary, Stoke-on-Trent, were elected Fellows of the Society. Jonkheer May, the Dutch Consul-General, exhibited a pupa and two imagoes of *Cecidomyia destructor* (Hessian Fly), which had been submitted to him for exhibition by the Agricultural Department. Mr. W. White exhibited, and made remarks on, a specimen of *Philampelus satellitia*, Linn., from Florida, with supposed fungoid excrescences from the eyes. Mr. Stainton said he was of opinion that the supposed fungoid growth might be the pollinia of an Orchis. Mr. Poulton expressed a similar opinion, and the discussion was continued by Mr. Pascoe, Dr. Sharp, and others. Mr. White also

exhibited a specimen of *Catephia alchymista*, bred from a pupa collected by Mr. Ralfe last autumn on the South Coast. Mr. M'Lachlan sent for exhibition a number of oak-leaves infested by *Phylloxera punctata*, Lichtenstein, which he had received from Dr. Maxwell Masters, F.R.S. Mr. Champion exhibited two rare species of Curculionidæ from the Isle of Wight—viz., one specimen of *Baridius analis*, and a series of *Cathormiocerus socius*. He remarked that *C. maritimus*, Rye, had been placed in recent European Catalogues as a synonym of the last-named species, but that this was an error. He also exhibited a series of *Cicindela germanica* from Blackgang, Isle of Wight. Mons. Alfred Wailly exhibited, and made remarks on, a number of living larvæ of *Antheræa pernyi*, *A. mylitta*, *Telea polyphemus*, *Platysamia cecropia*, *Actias luna*, *Attacus cynthia*, *Callosamia promethea*, and other silk-producing species. He also exhibited imagos of the above species, imagos of *Antheræa yama-mai*, and a number of species of Diurni from Sarawak. Mr. Poulton exhibited crystals of formate of lead obtained by collecting the secretion of the larva of *Dicranura vinula* on 283 occasions. The secretion had been mixed with distilled water in which oxide of lead was suspended. The latter dissolved, and the acid of the secretion being in excess the normal formate was produced. Prof. Meldola promised to subject the crystals to combustion, so that their constitution would be proved by the final test. Mr. Oliver Janson called attention to Mr. Pryer's new work, 'Rhopalocera Nipponica,' and to the fact that the illustrations had been executed by Japanese artists.—H. Goss, *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*July 28th, 1887.* R. Adkin, Esq., F.E.S., President, in the chair. The Rev. W. F. Johnson was elected a member. Mr. J. T. Williams exhibited bred examples of *Phorodesma amaragdaria* and *Dianthæcia irregularis*. Mr. West (Streatham), *Apamea ophiogramma*, taken in his garden at Streatham flying over ribbon-grass, which he had reason to believe was the food-plant of the species. Mr. Tugwell, *Apatura iris*, with pupa-cases. Mr. Hall, varieties of *Abraxas grossulariata*. Mr. South, two varieties of *Melitæa cinxia*, the usual dark fulvous marginal band of the under side breaking up into spots, or having a tendency to form ocelli. Mr. South stated that the two specimens were taken in the Isle of Wight, in the same spot, on the

11th and 17th June respectively, the first one being a male and the second a female. Mr. Dobson, a number of species of Lepidoptera from the New Forest. Mr. R. Adkin, living larvæ of *Spilosoma mendica*, reared from ova obtained from the Cork form of the species. Mr. Sheldon, *Pempelia palumbella*, from Leith Hill, *Ephippiphora nigricostana* (bred), and *Eupæcilia amandana*, which he stated he had taken in great numbers near Croydon, and the species seemed to fly for about two minutes only.

August 11th.—R. South, Esq., F.E.S., Vice-President, in the chair. Mr. Watson exhibited *Catocala promissa*, from the New Forest. Mr. West (Streatham), bred *Sesia asiliformis*, varieties of *Lycæna corydon*, and *Argynnis euphrosyne*. Mr. Wellman, *Dianthæcia albimacula*, *Bryophila muralis*, a yellow variety of *B. perla*, *Plusia interrogationis* from Perth, dwarfed forms of *Aspilates gilvaria*, *Eubolia bipunctaria*, and *E. limitata*; and living larvæ of *Chariclea umbra*, feeding on knot-grass. Mr. Mera, *Thera simulata*, from Ireland. Mr. Fremlin, a variety of *Vanessa urticæ*. Mr. South, a variety of *Triphæna comes*, the hind wings being a creamy white instead of bright yellow; a variety of *Vanessa io*, having a small extra ocelli on the hind wing. Mr. Helps, *Macroglossa stellatarum*. The Secretary, on behalf of Mr. Lewcock, exhibited a number of species of Coleoptera, obtained chiefly in Surrey, and read notes. 'There were twelve species of Donaciæ, including *Donacia hydrochæridis*, *D. lemnae*, *D. linearis*, *D. menyanthidis*, and *D. comari*. Also *Bembidium lunatum*, about a dozen specimens taken on the banks of the Thames at Rainham, Essex, in August, 1866; but it appeared, from Mr. Lewcock's note, that previously to this he had only come across the species singly. Several species of *Malachius*, *Cionus verbasci*, *Cryptocephalus lineola*, and many others were also in the box, the whole forming a most interesting exhibit. The Secretary read a letter from Mr. Adkin, recording the unusual abundance of *Pieris brassicæ* and *P. rapæ* in the neighbourhood of Eastbourne; and several members contributed the result of their observations in different localities; and a discussion ensued as to the probable cause of the appearance of these species in such numbers in the southern counties, in which Messrs. Rendall, South, Carrington, Tugwell, Wellman, Hall, Step, and others took part.—H. W. BARKER, Hon. Sec.

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NOTES ON ENTOMOLOGICAL CLASSIFICATION.

BY GEO. VERNON HUDSON.

IN an isolated country like New Zealand, where there are no public collections of insects and very few standard works of reference accessible, the entomologist who wishes to correctly ascertain the names and relationships of his insects is beset with difficulties, and the complete inefficiency of the present system of classification and nomenclature is made only too apparent. In the following notes I wish to draw the attention of your readers to a few suggestions, which I think would much simplify the present arduous task of arriving at the name of an insect.

In the first place, it appears to me that entomologists have no clear idea as to what ought to constitute family differences, generic differences, and specific differences; and that a diversity of structure, &c., that one regards as very unimportant, another considers sufficient to establish a new genus or even family upon. Again, I think that the *use* of the generic name has been completely lost sight of. If I understand correctly, the object of the genus was to facilitate the finding of the species; but now that genera are so excessively numerous and founded on such trifling differences, they are, in the majority of cases, just as hard to trace out as the species themselves; hence I contend that the present generic name is quite useless. It will thus be seen that I advocate a vast increase in the extent of genera and a great reduction of their number. The same argument will apply to families, whose members should have many very marked differences in common,

so obvious that the most cursory examination should detect them; thus the placing of an insect, as respects its genus and family, would be an easy task for the earliest beginner.

By thus denuding our science of its cumbrous technicalities we should at once render it more accessible to outsiders, and investigation would progress with much greater rapidity than it does at present, while the subject is fenced in, so to speak, by a needlessly complicated classification. Some of the time, also, which is wasted over searching out these unimportant distinctions would be much more profitably employed in elucidating the insect's habits, transformations, and internal anatomy,—a branch which is now sadly neglected. Another great advantage resulting from the use of large genera would be that species could not be established on such insufficient characters as they now often are. The presence of a great number of others in the same genus would render abundant distinctness necessary. It would thus greatly reduce the chance of the same insect being described twice over, and prevent synonymy to a very great extent.

I think that a fair estimate of the value of the genera at present in use may be gathered from the following:—In Mr. Butler's lists of New Zealand Noctuidæ, we have *Hadena debilis*, *Meterana pictula*, *Auchmis composita*, *Xylophasia rubescens*, and *Xylina ustistriga*, these insects being all referred by Meyrick to the genus *Mamestra*. Both these gentlemen are eminent lepidopterists, and both found their classification, I conclude, on the structural differences of the imago, yet how diverse are the results which they each arrive at. Numerous other instances of the same kind are doubtlessly well known to entomologists, and the conclusion is forced upon one that generic distinctions have become so ultra-refined that the very object of the genus is lost sight of, and at present entomological authorities are incompetent to determine what distinctions are of sufficient importance to be entitled to be recognised as generic.

To an ordinary student it must be admitted that a list of the names of the insects inhabiting any distant country is of little interest or instruction, owing to the majority of the genera and many of the families being unknown to him. Were these so far extended as to include insects inhabiting his own country, these lists would lose their dryness and become replete with interest, showing him the precise characteristics of the new fauna and its

peculiarities. This, I think, may be taken as one of the most forcible arguments in favour of a general classification, whose genera should embrace species from all parts of the world.

The adoption of such a system as I have indicated above would unquestionably be a matter of great difficulty, but I am satisfied that the time will come when something of the kind will have to be done. It needs but a slight retrospective glance to see how very much more complicated the classification of insects is now than it was a few years back; and when we reflect that there is nothing to prevent every entomologist from subdividing his own favourite little group to an almost unlimited extent, I think the necessity of some method of generalisation on broad principles will be obvious to everyone.

For purposes of every-day reference the genus is clearly the most important division, because in conjunction with the specific it is that by which the individual is always referred to, the two together forming in fact the "surname" and "christian name" respectively.* It therefore appears that the object to be aimed at is the extension of genera. This being done, the families must, of necessity, also become extended; and I think the following rules would be useful in classifying on this basis:—

The divisions subordinate to the order to consist of only three kinds,—families, genera, and species.

No genus to be constructed unless its members have several important attributes in common during *all their stages*.

The families would, of course, consist of a series of these genera, bound together by more important characteristics in common.

The highest object of entomological classification is to unite allied species in groups, in order to give a concise view of the great class Insecta, a result that can never be attained by endless subdividing; but even this systematic arrangement, however useful, cannot surely be regarded as the ultimate result of entomological research, as would in fact appear from the amount of attention at present bestowed upon it.

* It certainly seems a most unfortunate mishap that in biological classification the term "family" is applied to a group of genera or races. Were the terms transposed it would certainly seem more in accordance with common sense, but this of course is a reform that it is beyond the scope of entomologists or any other departmental naturalists to attempt.

In conclusion I shall illustrate my remarks by a suggested classification of the British butterflies, insects familiar to everyone, on the broad principles above given.

Family PAPILIONIDÆ, including all butterflies, or those Lepidoptera possessing a distinct club to the antennæ, and diurnal flight.

Genus *Papilio*.—Imago usually of large size, with six perfect legs in both sexes; the markings generally consisting of pale colouring, such as white and yellow. Larva smooth. Pupa angular, attached by the tail with a silken girdle round the middle. It would include the following species:—*machaon*, *rhamni*, *edusa*, *hyale*, *cratægi*, *brassicæ*, *napi*, *rapæ*, *daphidice*, *cardamines*, and *sinapis*.

Genus *Satyrus*.—Imago of medium size; front legs imperfect in both sexes; the wings nearly always much ornamented with ocelli. Larva with bifid tail spineless. Pupa suspended by the tail, but not angular, being occasionally, however, enclosed in a slight cocoon. Includes the following species:—*galatea*, *egeria*, *megæra*, *semele*, *hyperanthes*, *tithonus*, *ianira*, *blandina*, *epiphron*, *typhon*, and *pamphilus*.

Genus *Danaïs*.—Imago usually of large size, with very powerful wings and soaring flight; rarely marked with ocelli. Larva smooth, with fleshy processes. Pupa suspended freely by the tail, and slightly angular. Includes *plexippus*, *iris*, and *sibylla*.

Genus *Vanessa*.—Imago of moderate size, usually very richly coloured. Larva with numerous branched spines. Pupa very angular, suspended by the tail, and nearly always ornamented with metallic spots. Includes *cardui*, *atalanta*, *io*, *antiopa*, *urticæ*, *polychloros*, *c-album*, *paphia*, *aglaia*, *adippe*, *lâtona*, *cinxia*, *euphrosyne*, *athalia*, *artemis*.

Genus *Lycæna*.—Imago small; six perfect legs in female, four in male. Pupa secured by tail with a girdle round the middle, and not angular. Larva onisciform. Includes *lucina*, *betulæ*, *quercus*, *rubi*, *w-album*, *pruni*, *phleas*, *hippotoe*, *argiolus*, *arion*, *minima*, *icarus*, *ægon*, *astrarche*, *corydon*, and *bellargus*.

Genus *Hesperia*.—Imago of small size, very robust; six perfect legs in both sexes; hind tibiæ often spurred. Larva cylindrical, with no spines; feeding in rolled-up leaves. Pupa

enclosed in a cocoon. Includes the "skippers," *malvæ*, *palæmon*, *comma*, *tages*, *thauumus*, *sylvanus*, and *actæon*.

It will doubtlessly be urged that in the genera above given there are many groups of species resembling one another more than they do other members in the same genus. This is a difficulty, however, that can never be got over by subdividing. Take, for instance, the genus *Vanessa*, as at present restricted, and who will not admit that *urticæ* and *polychloros* are more closely allied to one another than either are to *io* or *antiopa*? While another species, *c-album*, bearing the closest resemblance to *polychloros*, is placed in some arrangements out by itself in the genus *Grapta*.

Another subject which I think calls for a brief notice is the use of complimentary names, which are unquestionably to be deprecated, bringing as they do the science into ridicule and contempt. I may say that among New Zealand insects this foolish practice of naming species, and even genera, after individuals has obtained to a lamentable extent, as may be seen from our catalogues, which consist of little else but personal names.

Wellington, New Zealand, July 25, 1887.

THE EDUCATIONAL VALUE OF ENTOMOLOGICAL COLLECTIONS.

BY JAMES W. TUTT, F.E.S.

MR. CALVERT (Entom. 196) has written a most interesting article, many of the remarks in which the readers of the 'Entomologist' will undoubtedly endorse most heartily; but it seems rather to deal with the defence of the time spent on Entomology than the phase Mr. Coste seemed to me to wish to present (Entom. 93), viz., the "educational value of forming a collection by a collector of limited time, and whether, considering the immense amount of labour entailed in setting the specimens, the educational result is worth the time spent on it."

As an ardent entomologist and a professional educationist, I must state that I believe the ground Mr. Coste has taken up practically unassailable, and that the time that really enthusiastic

entomologists spend on Entomology does not produce one-half the educational result that other subjects would by spending a very small fraction of the same time on them. That there is some educational value every educated person must confess, and Mr. Coste states this most positively in his article. The question is the amount of educational advantage obtained compared with time spent. Concerning the educational value of Entomology, the great value of Entomology seems to be that it increases our powers of observation and discrimination. No science could increase them better, but there are branches of science where the powers of observation and discrimination are equally developed. Botany would do so, and with less laborious indoor work, although a good deal of that is needed if a good botanical collection is made. The power of reasoning is developed but little comparatively by the science, and all other senses are equally or more specially developed by other subjects with far less labour. From this I must except order and regularity, developed by the proper arrangement and classification of the insects we collect. Would any reasonable man suggest that his son should be put through a course of Entomology for its educational value? I have put hundreds of lads through a course of "General Biology" where Entomology has had its place equally with the great facts of Physiology, Zoology, and Botany; but to deal with it specially as an educational means has never entered my mind, enthusiastic entomologist though I have been for years.

This is the view I believe Mr. Coste meant to place before the readers of the 'Entomologist,' and I may say emphatically that if a man takes up a subject entirely from an educational point of view and with the idea of improving his general education, he would do infinitely better to put himself through a course of Physics, Biology, Mathematics, or some such science. If his taste incline to Natural History, let him take it up as a whole; he will get a greater educational result out of it. One or two seasons spent in collecting Lepidoptera would be sufficient to give a collector the knowledge of the habits of many species, a knowledge of the embryological states, of the differences in structure of the various larger families, and metamorphoses through which Lepidoptera pass; in fact, all the chief educational *points*, as well as a knowledge of classification.

We now come to another phase of the subject. If educationally "the game is not worth the candle," and I am satisfied it is not, is the time we spend on Entomology defensible, or is such time wasted? My answer to this is, that the time spent on Entomology is perfectly defensible, and that such time is not wasted. Entomology as we study it, or rather the entomological collections which we make,—and to me there is a vast deal of difference here,—is a hobby, purely and simply a pleasant occupation to fill up spare time, and an illustration of the old couplet, that "All work and no play makes Jack a dull boy." The harder we work at our daily labour the more necessary is recreation for our physical and mental health. After most severe mental work I find I can always turn to Entomology with pleasure, and after an hour or so feel entirely invigorated. Is this education? It may be. I think it recreation. It is a pleasure to me, and I dare say it is to hundreds of others. Again, not only is the collection in itself valuable as a relief to which one can turn at any time, but the actual process of collecting is in itself to be considered. The formation of a collection is in itself an incentive to outdoor exercise and recreation; and to men of sedentary or indoor occupations, *what* does this mean? Only those so engaged can tell, and those in large towns—London, Liverpool, &c., where the conditions are emphasised to an alarming extent—feel the reaction more than all. I have often thought that it is this feeling or craving for the country that has increased the number of entomologists in our large towns to such an extent, as compared with those in the rural districts.

I think I have said enough in defence of the time we spend on Entomology, and I believe I am right in the view I have taken of Mr. Coste's article. He undoubtedly, when he wrote his article, was fully convinced that there was an educational value in Entomology; the point he wanted discussed was whether the educational result obtained was at all equal to the time spent on the subject. Let me consider another point in connection with the question. What time do we spend on Entomology? and *what* educational value is returned for this time? For this purpose we may consider the question under three heads:—

1. The actual collecting of specimens.
2. Pinning and setting.
3. The arrangement of the collection.

(1) Whatever time is spent on the actual collecting of specimens is time well spent, educationally and otherwise. One learns incidentally something of Geography, Meteorology, Botany, and perhaps a little Geology. The collector's powers of observation are greatly increased, and one can hardly find anything that has a better educational value from this particular point of view. The amount of time is therefore unimportant. The greater or less the amount of time spent, the greater or less will be its gross value. (2) As the specimens must be kept, whatever the subject of study, the time spent on pinning need not be considered. In my mind nearly the whole of the time spent on setting is wasted educationally and scientifically. I certainly do not know exactly what time entomologists, as a body, spend on setting, but I find I can set about 20 to 25 insects per hour, on an average. Many of the *Tineina* require a much greater amount of care, and 15 to 20 would be a fair estimate. Taking it, therefore, that a collector takes 100 insects as the result of a day's collecting, he will be about five hours setting his captures. Is the study of the "flexibility of the wing, its debility, hardness," &c., worth this time to a man who is seeking for self-improvement? and when this is repeated day after day and year after year this as a result becomes ridiculous. Presuming I have spent on an average 500 hours per year in setting insects for the last seven years, am I to be told that the educational value of these things is at all commensurate with the time spent? We do not get new species every time we go out, and yet we get a large number valuable to ourselves and friends. These have to be set—custom demands it. The question is, Is the custom a good one? and what was the original reason of setting? Considering the latter question first, there is no doubt that setting was originated so that all the wings might be studied. There is no doubt, then, that the answer to the first question is, that the custom is a good one. But what has setting developed, I might say degenerated, into? Science demands that we should be able to examine all the wings. To have the wings, therefore, drawn out at any angle, so that the whole of them is in view, should be sufficient. But what do we find? We find that in 99 cases out of 100 our collectors study symmetry, and symmetry only. What does it matter to them so long as the angle between the anterior and posterior wings is so exact that the most perfectly trained eye cannot

distinguish the slightest difference? What do they care about the hind wings being half covered up? This system of setting takes all the time, and in the end what is its value? Will anyone venture to assert that there is any real educational value in it? It is a purely mechanical operation. I repeat that there is very little science or educational value in this exactitude, and that the setting could be done just as well for educational purposes in much less time. I quite appreciate good setting, if the individual says, "I do it for pleasure or recreation"; but to argue that our system of setting is of educational value is another thing. One might say that you can make a more exact study of an insect while you are setting it; but this I doubt. Setting takes up a large amount of time. It is a slow, mechanical, and monotonous process, trying to one's patience, and I might add to one's back, without a corresponding return from any point of view. But setting is adopted by most entomologists. We are gratified by the beauty of our specimens when thus set, and I suppose it will thus go on whilst the study of Entomology exists. Can anyone tell me whether any of our really scientific entomologists has a collection of *unset* insects, and does not set his specimens? I feel certain there must be some individual above the popular prejudice.* (3) The arrangement of the collection is another purely scientific and educational matter, and worth all the time spent on it. A man who can classify the families, subfamilies, and genera of Lepidoptera has grasped the whole educational principle involved in such-like studies,—the need of arrangement and order, the advantage of system over chaos.

I dare say my views will be pooh-poohed by many entomologists, but I speak, as stated, as a professional educationist. The scientific lepidopterists of Britain can almost be counted on the fingers of the hands, or at any rate those who are publicly useful as such in making known their views for general use. The writers on popular branches of the subject perhaps number 50, and those who record captures, &c., 200 or 300 more; but of what scientific value is the work of the others? They *collect* Lepidoptera, and want a series. They care little about the habitat or anything else in connection with the natural history of a species. They

* We believe that more than one scientific entomologist in this country, including Mr. Edward A. Fitch, F.L.S., recently Secretary of the Entomological Society, considers it unnecessary to set the specimens in their collections.—Ed.

have another addition,—a thing of beauty; and it is sufficient. Of such are the great mass of us. Are we to be discouraged? and is our work useless? I say decidedly, no! The man who can turn, after his daily toil, to admire his beautiful entomological treasures is to be encouraged. It is educative, as far as it goes. It leads such a man to think, and opens to him something unknown to others of his own class. To those who already have a fair education it is a pleasure and a recreation, a labour of love. If we do the great mass of humanity no good, we do them no harm; and we improve our own minds. Among such, I class myself; and it is worthy of remark how many entomologists, who, commencing to collect in their boyhood, obliged when manhood comes on to give up their favourite pursuit to provide for their daily bread, take to it again in mature years as a relief and pleasure after their final struggle for mere existence is over. Entomology with the mass of entomologists is a recreation, whatever they may choose to call it—Science or otherwise. As such, it gives us great pleasure and affords some amount of education; at the same time I defy anyone to prove that a man would improve his education by taking up Entomology as a study, compared with what he would gain if he spent the same amount of time on other subjects.

With Mr. Calvert's answer to the question, "Of what educational value is such a collection?" (*Entom.* 197), I partly agree and partly disagree. I perfectly agree with the first part, but the latter seems ridiculous. Who is most likely to get wet? The collector who goes into the country collecting at every possible chance and at all times of the day and night, or the man who, choosing his own time, goes from his own house to the museum, and can make every preparation for the weather. I should like Mr. Calvert to have been with me the first night I spent on the Deal sand-hills in 1883. He would have found that collectors sometimes get wet.

His answer to the last question (*Entom.* 198), "From an educational and scientific standpoint is the game worth the candle?" does not seem to touch the question. He shows that it sometimes may be from a monetary point of view, but surely this wants a good stretch of imagination to convert it into "educational and scientific." The collecting and arranging of entomological specimens, I have tried to show, has an educational

and scientific result, which is "well worth the candle," but setting puts the matter out of court; and the hundreds of hours I have spent on setting I consider educationally wasted. I collect for a hobby—I treat it as such.

We are sure to have a plentiful addition of young recruits to our ranks. A mild form of science, coupled with a fine field for recreation, both in mind and body, is sure to attract a fair number of workers in the cause. But let them enter under the "true colours." Don't try to entice them into our ranks with the idea that their education will thereby be materially improved, but show them that it is a most healthful pastime to those who have leisure, and can afford to spend time and energy on a pursuit that must bring them a vast amount of personal satisfaction and pleasure.

To the man seeking for education in entomological pursuits, I would say,—make a small typical collection of the great group Insecta; or, better still, if the student desires to take a wider field, of the families Annulosa and Mollusca. Classify correctly by all means, have good perfect specimens as far as possible; but if the student's time is limited, let setting go to the wall. The collection would not be worth much to those who buy Natural History specimens, like some people buy "old pots"; but the educational value of such a collection to the individual making it can hardly be over-estimated.

Snowsfield's Board School, Bermondsey, S.E., August 22, 1887.

NOTES UPON NEPTICULIDÆ.

BY J. B. HODGKINSON.

ON the 13th of April I reared four specimens of *Nepticula hodgkinsoni* from a variety of garden rose, and from the same shrub three others of the genus, two of which are as large as *N. aurella*; possibly they are of the latter species, though they were reared in sealed and labelled boxes. In the same month I bred what should be *N. splendidissimella*, from leaves of dewberry (*Rubus cæsius*) which I gathered near Southport in September previously. My experience of *splendidissimella* coincides with that of the late John Sang, that it is a strictly raspberry-leaf

feeder and single brooded. It is a much finer and more delicate mine than that of *N. aurella*. I again found the larvæ early this September, the raspberry growing among brambles which were mined by plenty of *N. aurella*. Next to appear were a few *N. gratosella*, *N. ignobilella*, and *N. pygmæella*; also *oxyacanthella* from hawthorn. From birch came *N. argentipedella* and *continuella*; of the latter I had only a few mines. I bred about thirty specimens of *N. headleyella* from larvæ kindly sent me by Mr. W. H. B. Fletcher. *N. glutinosæ* were a sad failure; of about forty larvæ which changed to pupæ and looked well I did not rear one moth. Nearly the same may be said of *N. intimella*, for I had more than fifty cocoons, and only bred two specimens from sallow leaves, but I got a dozen *N. salicis*. Of *N. luteella* a very few appeared.

During the months of June and into July I took a considerable number of Nepticulæ; some I cannot determine. *N. luteella* and *intimella* were fairly represented. My best catch of *N. intimella* got lost; the canister and a lot of boxes in it slipped out of my pocket. *N. glutinosæ*, *N. alnetella*, and *N. continuella* were among the best in July and August; I went fairly in for larvæ of *aucupariæ*, *lapponica*, and another birch species, probably a new species. The larva feeds differently to any I am acquainted with; it occurs on ground I had not trodden since 1863, and then I was not after Micro-Lepidoptera. I also found *N. continuella* quite common; I must have taken several scores. From August 18th to 25th I took about two dozen of what I expect will prove *N. hodgkinsoni*.

I made two journeys to a district where I had not hunted for Nepticulæ, to see if I could find any *N. tilia*,—a locality I should think as yet unvisited by entomologists. I saw one tree of *Tilia parvifolia* infested by this little larva, and took over a hundred of the mines containing larvæ; but the majority were empty. The mines of this species are easily seen. Another tree about a mile away produced a lot, some full-fed, others very young. Here I saw a sight unknown to me which I think should be noted, viz., what I suppose to be the larvæ of *Bucculatrix thoracella* (*hippocastanella*) hanging by threads; presently I found a little snowy-white circular cocoon on the surface of a lime-tree leaf. I found no more, but on my return a few hours later they were in plenty on the leaves collected, the larvæ

having thus quickly encircled themselves. I had only an hour to spare after a long and hot day's work, but was fortunate enough to find other species of *Nepticula*, one being in leaves of the species of *Potentilla* which *Peronea aspersana* rolls up when in the larval state; another was in leaves of the lesser burnet (*Poterium sanguisorba*), which should be *N. poterii*. The other was *N. cryptella*, in the leaves of *Lotus corniculatus*; this I recognised, having seen it before near Darlington.

Everything was scorched with the great heat, but in the thickets was Solomon's-seal, a variety of plants somewhat strange to me. There was a bramble, which I make out to be *Rubus saxatilis*, containing *Nepticula* mines, but I only got one larva, which I fear is dead. I hope to visit the locality next season, and work up these interesting species.

Another instance of bramble mining occurred to me at Port Erin, in the Isle of Man, where the leaves were chequered by *Nepticula* mines, but whether of *N. aurella* or not time will tell, though the mines are broad enough for another species.

On Sept. 13th I met with *N. myrtillælla* among a very few examples of its food-plant, there being two or three mines in a leaf. Of *N. alnetella* or *glutinosa*, fair numbers occurred on the alder leaves, but, as usual, this season great quantities were dead in the mines, killed by the extreme heat. There was in the leaf a large mine, broad as that of *N. aurella*, the larvæ in them being yellow. *N. ignobilella* was in hawthorn leaves, and *N. angulifasciella* was abundant on the roses; I never noticed before that it has a row of spots distinctly shown down the back. *N. marginicolella* occurred on elm; *N. septembrella* in leaves of *Hypericum*; and on sallow were either *N. salicis* or *N. intimella*, I cannot decide which from the mines; *N. æneofasciella* on agrimony.

Ellerslie, Ashton-on-Ribble, Preston, Lancashire, Sept. 14, 1887.

THE MONGREL-HYBRID THEORY.

By CHARLES A. BRIGGS, F.E.S.

It is much to be regretted that Mr. South has tried to import *Polyommatus phleas* and *Thecla rubi* into a discussion that already was sufficiently ample in its scope. He tells us

(Entom. 123) that *Lycæna corydon*, *L. icarus*, *L. bellargus*, *L. hylas*, *L. escheri*, and *L. eros* are all from a common stock in direct descent; and that *L. icarus*, *P. phlæas*, and *T. rubi* are all from a common ancestor (Entom. 220). What other descendants he may in time father upon this versatile and highly gifted predecessor we do not as yet know.

Lycæna icarus, he tells us (Entom. 125), is the most ubiquitous and the dominant form in the group. Is this why he selects it, with *corydon* and *bellargus*, to be branded as an impure species? Are *hylas*, *escheri*, *eros*, *rubi*, and *phlæas* to be regarded as pure, and if so, why?

That these species ever had a common ancestor may or may not be the case; but, as all that we can be absolutely certain of is that there is not the slightest scintilla of evidence of such being the case, or any real necessity for such an idea being set up, this convenient and ingenious theory may be dismissed as "out of the range of practical politics." The real cause of Mr. Sabine's varieties (I call them his, as he, so far as I know, first recorded them) has yet to be found; but it should, I think, be sought in the present, not in the past,—probably indirectly in geological and directly among local or phytophagical causes.

As regards the original matter in discussion, Mr. South, if he has done nothing else, has, without any clear definition of it, given to Entomology a new word, "mongrels," which no doubt in future times will enable other theorists to get out of many an awkward fix without too great a loss of plumage.

Mr. South candidly tells us (Entom. 1) that he has given some hours to the study of such species as *L. icarus* and *L. corydon* in their native haunts, "with the object of obtaining a knowledge, as far as was practicable, of the whole range in variation of these species, in particular South of England localities"; and no doubt he has succeeded in doing so. Many of us have spent years at it, and do not consider that we have yet exhausted the subject, or found ourselves driven to the creation of theories.

From his recent papers and notes in the 'Entomologist' it would almost seem that Mr. South, having come across specimens of some species of *Lycænæ* which appeared to a certain extent either to partake of or to resemble characters belonging to other species of the same genus, first jumped to the conclusion

that these specimens must therefore be hybrids, and then, finding himself face to face with the difficulty that fertile unions of different species of Lepidoptera in a wild state are known to be so rare that that theory would be open to the gravest suspicion, sets up the still more objectionable one that *Lycæna bellargus*, *L. icarus*, and *L. corydon* are not really species, but some nondescript class of creatures hitherto wholly unknown in nature, and neither fish nor flesh nor good red herring. In a word, being perplexed by *L. hylas*, he sets up his "impure" theory, and bastardises *L. icarus*; being bothered by *L. corydon*, vars. *corydonius* and *albicans*, he applies it further, and quietly finishes up by throwing in *L. bellargus* as a sacrifice to his remaining difficulties.

How eminently unsatisfactory the result of all this speculative theory is appears from the fact that Mr. Sabine (Entom. 40) considers his as hybrids, not mongrels, between *L. bellargus* and *L. corydon*, or between *L. bellargus* and *L. icarus*, being apparently somewhat influenced by the fact that he had once seen *L. bellargus* male in copulâ with *L. icarus* female. Mr. Jenner Weir, Mr. Sabine tells us, considers them hybrids between *L. bellargus* and *L. icarus*, he having once seen those species in copulâ; while Mr. South himself considers them as mongrels, not hybrids, between *L. bellargus* and *L. icarus*, and fertile to boot.

Like other advancers of new and wholly unsupported theories, Mr. South endeavours to fix the *onus probandi* on those who uphold the existing ideas, instead of placing it, as it should be, on those who seek to disturb them; for (Entom. 82) he placidly states that, so far as he knows, the sterility of a cross between *bellargus* and *corydon* has not been demonstrated, and asks whether we have any proof that the pairing of *icarus* and *bellargus* is, as regards progeny, inoperative! Seeing, however, the fresh difficulties into which his unfortunate theory was leading him, he somewhat unfairly takes to task Mr. Tutt (Entom. 221) for attributing to him the suggestion that *icarus* and *bellargus* copulate freely together in nature, and admits that such an idea might be characterised as improbable. But does he not overlook that Mr. Sabine (Entom. 181) is driven to acknowledge that such unions must in his locality be a tolerably common event, while Mr. Tutt (Entom. 207) says that the

Rochester collectors used to take large numbers of these varieties everywhere on the chalk hills between Rochester and Maidstone, and that it occurs through North Kent almost to Gravesend? Mr. Sabine (Entom. 181), as Mr. Tutt points out, in fact demolishes the whole theory when he asks, why do not these unions occur elsewhere also?

In my own experiences in the Folkestone and Dover district during the past twenty-five years, although I have so constantly seen *L. corydon*, *L. icarus*, *L. bellargus* and *L. medon* flying together that it may be regarded as the normal state of affairs, yet I have never known any of these species *in copula* with others, nor seen any specimen out of the many thousands that have passed through my hands which could reasonably be regarded as hybrid or mongrel, whatever the latter word may mean; I cannot help, therefore, thinking that the theory, not the genus *Lycæna*, has got a trifle mixed.

Boisduval, in his Monograph of the Zygænidæ,—another group of closely allied species,—mentioning instances of crossing between certain allied species of Zygæna, states that never had he known fertile eggs result from such unions. Such is, I am sure, the experience of us all with Lepidoptera in a wild state.

In a previous paper (Entom. xix. 6), Mr. South has told us that *L. argiades* has continued to exist in England since the middle post-glacial epoch. I entirely disagree with him. To suppose that a conspicuous diurnal insect has escaped detection in England for even the last thirty years is a proposition so startling that it requires more than the enunciation of a ready-made theory to enable us to believe it, particularly in these days when the introduction of a species, accidentally or otherwise, is no difficult matter.

There is another point in Mr. South's papers which should not pass unnoticed. He states (Entom. 125) that, so far as Great Britain is concerned, *L. icarus*, coming from North-west Europe at a time when our islands were united with the Continent, came first into Scotland, extending thence through the Scottish Islands to Ireland, subsequently appearing in England *viâ* France. Is not this really the merest surmise? Can he adduce any proof whatever that Great Britain, in days when our lepidopterous fauna existed, was connected with North-

west Europe at a time when it was not connected with France? If it was then connected with France, was not that the more probable route of the advancing *icarus*, if, indeed, *icarus* ever did advance in that sort of way? If England was not then connected with France, what becomes of the blown-over theory? Why should not that be at least as likely as the early post-glacial Scandinavian invasion theory. Or does Mr. South contend that *icarus* was in North-west Europe, meaning I suppose Scandinavia, at a time when it was not in France?

Will Mr. South give us his reasons for these speculations? Surely to state in so *ex cathedra* a way that in the middle post-glacial epoch *L. bellargus* and *L. corydon* preceded *L. argiades* in its appearance in this country, and were themselves long preceded in the early post-glacial times by *L. icarus* and *L. ægon*; that *L. argiades* has always been with us, but that *L. batika*, appearing here under almost similar circumstances, is a recent acquisition; that some species first invaded Scotland, others England; is to claim an omniscience fortunately denied to mankind.

55, Lincoln's Inn Fields, Sept. 10, 1887.

THE LYCÆNIDÆ OF NORTH KENT.

By J. W. TUTT, F.E.S.

MR. SOUTH and I apparently hold very different views as to the relation between our three species (hitherto so-called) of the genus *Lycæna*, viz., *icarus*, *corydon*, and *bellargus* (Entom. 220). Granted that Mr. South does not consider his use of the terms "hybrid" and "mongrel" synonymous, I believe that those who look upon the three species as perfectly distinct do not perceive the difference. With a fairly good continental collection of Lycænidae, comprising all the species Mr. South mentions (Entom. 1—127) and many more for reference, I find that, although there is much in his remarks (Entom. 1—127) with which I am in perfect accord, his suggestion that the above-named species are not "pure species" does not commend itself to me; and I must add that I believe the differences between any two of these three species to be quite equal to that between the more closely allied European Argynnidæ and Melitææ, and their distinct

development to be quite equal to that between our own *A. selene* and *A. euphrosyne*, especially that of *L. icarus*, with either *L. bellargus* or *L. corydon*. I believe the two latter are less highly specialised, or separate from each other, but still sufficiently so to answer all the general purposes and fulfil the special functions which species are supposed to possess *inter se*. If we are to accept Mr. South's view as correct and apply our connecting-links to an almost indefinite extent, I am afraid we shall have but few species; and as he himself has stated that *L. icarus*, *Polyommatus phlæas*, and *Thecla rubi* are descended probably from a common ancestor, why should we not, proceeding on the above lines, call the common ancestor a species, and treat all and each of its descendants as varieties or aberrations? Of course this is extreme, but it should be the result on general grounds. We must be very careful, when we find apparent connecting-links, how we do away with the specific claims of forms which are as highly specialised and distinct in themselves as they possibly can be, so far as we are able to judge.

Holding the view therefore that *corydon*, *bellargus*, and *icarus* are distinct as species,—and I believe this view is still held by a great majority of entomologists,—I consider that Mr. South's use of the term "mongrel" and my use of the term "hybrid" synonymous, both being used as the offspring of a union of what we generally consider distinct species. Mr. South's idea of "mongrelisation" in this matter corresponds exactly with my idea of "hybridisation." Mr. South may say that he has never stated they are not "species," but I maintain that if they are not "pure species" they are only aberrations, and not species at all.

I am sorry the paragraph (Entom. 208) was not more explicit. It referred in a general way to Mr. South's idea of "crossing," but it was directed almost entirely so as to bear on Mr. Sabine's statement (p. 181) that "most probably" his varieties "were hybrids, and if so unions between the two species must be a tolerably common event here." I should be sorry to lay to Mr. South's account the charge of believing in "wholesale hybridisation in nature," and I am pleased that Mr. South agrees with me in this matter, and considers that I am justified in characterising such "wholesale hybridisation" "more than improbable." It adds a great deal to the value

of the position I have taken up when we consider that Mr. South decidedly believes these insects to be "not pure."

Mr. South says that I ignore the "blue-black form" of the male altogether. I did so purposely, because I did not care to discuss the matter, holding a different opinion to Mr. South with regard to it. I have never taken this form, and never remember having seen it; but I have carefully read Mr. South's description, and from this I should say it most probably is not a case of atavism or recurrence to a primitive type in a direct form, for the following reason: if *icarus*, as we both maintain, is the primitive form of this particular group, then the blue-black form could not very well be a recurrent form. Typical male *icarus* are a paler blue than *bellargus*, and hence, while I hold that the pale varieties are decided cases of atavism, I believe the blue-black form to be only a sport, or rather a case of the male having a tendency to partake of the coloration of the female.

Mr. Sabine (Entom. 222) throws doubt on my statement as I had not seen his specimens; but Mr. South's descriptions are exceedingly good. Many entomologists must have read these descriptions and understand our argument without having seen Mr. Sabine's insects. I have taken the form occasionally for years; sixteen years ago (1871) I took my first. At the South London Nat. Hist. Society's Meeting on Thursday, August 25th, Mr. Sabine exhibited his specimens when I was present. His pale form is identical with the form I wrote about, and with the specimens I still have in my cabinet (labelled June, '75). There can be no doubt now on that score.

I am perfectly aware that *icarus* flies with *bellargus*, and I have to offer an apology to the readers of the 'Entomologist' for the statement under question. It was the result of dealing with two distinct matters at one time. I had Mr. Sabine's statement (p. 182) "that unions between *corydon* and *bellargus* have been most decidedly possible, and any number of them, too," running in my mind; hence the unfortunate error.

This year has, as Mr. Sabine says, been an exceptional year. I was collecting on the chalk-hills near Cuxton on August 15th, and saw many *corydon* (worn), but no *bellargus*; but on the 19th six male *corydon* (worn), five females in much better condition, and just two dozen freshly-emerged male *bellargus*, but no

females. On Sept. 3rd *bellargus* in plenty, but not a single *corydon*. This year is, of course, abnormal. Owing to the late spring *corydon* larvæ were being collected at the time the imago should appear, but the pupal stage was short. Mr. Sabine's notes and mine differ only in degree. He suggested the occurrence together of the two species as normal; I found it abnormal.

With regard to the concluding sentences of Mr. Sabine's note, he does not seem to have read my note (Entom. 174) carefully, as he makes one or two misleading statements in referring to it. (1), I was not at Cuxton on June 6th. (2), I did not state that *bellargus* was not out there on June 6th; it may have been, I was not there to see. (3), I was at Cuxton on June 4th, and was probably a day or two too soon. With regard to my reference to June 22nd, I gave it as a late date, and more nearly approximating to the earliest possible appearance of *L. corydon*.

I would suggest that if arguments on such matters as the subject before us are to be of the least scientific value, the collector who suggests or supports a theory, or proposes a question, should give the readers of the 'Entomologist' sufficient information and data as to peculiarities of flora, geological structure, and general environment to sift the matter out, and to aid them to form a correct opinion.

Rayleigh Villa, Westcombe Park, S.E.

[Apology is due to Mr. Tutt for considerable reduction in length of his article, which very fully replied to the remarks on the subject which appeared in our last number; but in our discretion we have condensed his reply.—Ed.]

NOTES ON *LOBOPHORA VIRETATA*.

BY THE REV. CHAS. F. THORNEWILL.

On June 2nd last I visited Sutton Park in search of *Lobophora viretata*, and found the insects in abundance sitting on the trunks of the hollies, preferring the darkest and most sheltered places. They were by no means easy to take, frequently flying off before I could box them; but in all I took sixty-six specimens,

and of these sixteen were females, which are easily distinguished from the opposite sex by the absence of the "lobe" on the hinder wings.

I placed five of these females in a well-ventilated box with some sprays of holly in blossom, hoping that they would lay, killing and setting the remainder. On inspecting my setting-boards a day or two afterwards I found four eggs, laid by as many specimens of the females, on the boards. I transferred these to a glass-topped box, in which they hatched on June 10th, one young larva being pale yellow, with a black and very distinctly bifid head. I supplied my larvæ with flowers of the holly and mountain-ash, the latter being also fairly abundant at Sutton, and likewise with leaves of privet; but I found that the flowers of the holly alone were eaten, and upon these the little larvæ thrived amazingly. Meanwhile my five females in the box were all dead, and, on examining the holly-leaves and flowers closely with a magnifying-glass, I failed to detect a single egg. However, I transferred the flowers, which by this time were withered, to the box which contained the other larvæ, and in a few days two more larvæ made their appearance, a welcome addition, as one of my original five had somehow been lost. The holly-flowers were now all withered, but, upon the substitution of young berries, the larvæ took to them at once, gnawing into the berry close to the insertion of the stalk, and greedily devouring the interior.

The larvæ now began to assume a greener tinge, and in addition to this three out of the six were marked down the back with chocolate blotches, which varied in size and intensity of colour in the different specimens, reminding one closely in this respect of the larva of *Asthena blomeri*. They appeared to feed almost exclusively at night, resting in the day-time in a curved position upon the stalks of the holly-berries, to which they were attached by the claspers only, the fore part of the body being raised. I noticed also that they had spun a number of fine silken threads around the spray on which they fed, to which the pellets of frass were plentifully attached; and from this I can fully understand what my friend Mr. Bath has informed me, viz., that although he has several times beaten the hollies at Sutton for this larva, he has never yet succeeded in obtaining it.

My larvæ fed up rapidly, and on June 28th I found the two

largest at the bottom of the box, evidently on the eve of pupation. I transferred them to a chip-box, half filled with earth, upon the surface of which I had scattered a few bits of thin paper; and in this box they changed to pupæ, making a flimsy cocoon of silk and fragments of earth, roofed in with paper.

I had previously given the finest of my larvæ to Mr. G. Baker, of Burton-on-Trent, by whom it was preserved for the collection of my friend Dr. Mason. The other larvæ pupated in course of time, and I am now (Sept. 1st) waiting to see whether they will emerge this month, or remain in pupa till next spring.

I find, on consulting the 'Entomologist's Monthly Magazine,' vol. xiii. p. 185, that the late Mr. Buckler has written an admirable account of the larval state of this insect, which I hope will eventually be embodied in one of the Ray Society's volumes. I observe, however, that Mr. Buckler says:—"I find nothing to show that it has more than one brood in the year, or more than one food-plant, *viz.*, privet, for the larva." Both these statements must obviously now be modified.

The Soho, Burton-on-Trent, September, 1887.

THE HESSIAN FLY.

By ELEANOR A. ORMEROD, F.E.S.

REPORTS from correspondents acquainted with the attack of the Hessian fly show its presence now in an almost continuous line along the northern and eastern coast from Cromarty on the Moray Firth in Scotland down to Kent.

The most northerly locality from which I have at present received specimens of puparia is from the parish of Urquhart, in Morayshire. Further north than this I am not aware of it having reached, and on the 10th inst. information was sent me by Mr. George Brown, of Watten Mains, Caithness, a well practised entomological observer, that he had "been on the outlook, but had never come across anything bearing the slightest resemblance to attack from these pests;" and, so far as he could learn, Caithness was as yet free from a visitation of them.

The amount of presence varies very much. In the locality *above mentioned* (that is, the district from Aberdeen to Cromarty),

the traces of attack are reported as to be found from twenty-five to thirty miles inland, but the injury slight, not more than one straw in fifty being affected, and the grain of fair quality. It is severe in some parts of Perthshire, and is found also in the eastern counties adjacent.

In East Lothian, Haddington, and Berwickshire attack is only reported from a few places at present, and in Northumberland from one locality.

Beginning again on the two sides of the Humber, the attack widens much in area as it is traced south. It passes through Lincolnshire and Cambridgeshire, touching an easterly part of Northamptonshire, till it extends over the district commonly known as the eastern counties, including besides great attack in Hertfordshire, and some in Bedfordshire; and it also occurs in Kent.

In the southerly or westerly parts of England it occurs at Lymington and Petersfield in Hampshire, and to a considerable extent near the College of Agriculture, Downton, near Salisbury; and I have one report of it from near Bridgwater, and it also occurs at Goring Heath, Oxfordshire.

The above localities are where I know of its presence from specimens sent to myself, or, in a few cases, from information given me by correspondents whom I know to be acquainted with the appearance of the puparium, and the characteristics of the attack. It very likely may occur elsewhere, but I am only just giving a general sketch of extent of infested area from personal knowledge. It strikes me as a very curious point that the attack should so markedly cling to the sea-side, excepting in a few isolated instances, or where the inland area is continuous with the sea-side district.

It is very satisfactory to observe that although the season has been so altogether extraordinarily favourable to various kinds of insects affecting corn-stems, yet that in very many instances reported to me the injury caused to wheat by Hessian fly has been slight. On this fact I venture to think we may ground a hope that, either from the varieties of wheat which we use being kinds suited to do what is called "resist" attack, or from circumstances of our cultivation, we may find that our wheat at least does not suffer as much as in some other countries; and I venture to take the opportunity of suggesting to your readers that I should feel

greatly obliged by being favoured with the names of any varieties of wheat which may have been known with certainty to have been infested by *Cecidomyia destructor*, and yet not to have been seriously injured.

Also the enormous prevalence of the two stem attacks caused respectively by the corn sawfly, *Cephus pygmaeus*, and by the dipterous fly, the *Chlorops tæniopus*,—attacks which far exceed in amount any which have been brought under my notice as caused by these insects,—give a hope that the climatal circumstances which usually prevail here will have an effect in checking the attack of the *Cecidomyia destructor*, as well as the above-named crop pests, as we see that all three kinds have been exceptionally thriving in the heat and drought, exceptional here.

Whilst I write, information has arrived from Prof. F. M. Webster, of Lafayette, Ind., U.S.A., that the much more severe extent of drought there has (up to date) checked appearance of the pest, and the record which is being taken of climatal effect will be of much use.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

EXTRAORDINARY ABUNDANCE OF *PIERIS RAPÆ*.—One noticeable feature of the present season certainly has been the superabundance of *Pieris rapæ*. In the larval condition these have been a source of great annoyance, both to the gardener and agriculturist. One day early in the present month of August, a friend of mine, whilst seated on the downs near Broadwater, a village close to Worthing, happening to look up at the moment, saw the air filled with what he at first took for thistle-down, but which proved to be a large cloud of white butterflies (*Pieris rapæ*), of which there were scores upon scores. They have also been seen settled in this neighbourhood upon various plants in such numbers that handfuls might have been easily collected in a few seconds. It is somewhat remarkable that in the *Colias edusa* year of 1877,—of which, by the way, I have not seen a specimen this year,—when the fields and gardens were teeming with this favourite but capriciously-appearing butterfly, it would have been difficult, at least so far as my own experience goes, to have taken a dozen whites of either species throughout the day.—JOSEPH ANDERSON, Jun.; Chichester, August, 1887.

ABUNDANCE OF PIERIDÆ.—The swarms of white butterflies have been phenomenal in this neighbourhood and in the clover fields; nearly every flower-head has been conspicuous by its rifling *Pieris*.—WINDSOR HAMBROUGH; Hamilton House, Odiham, Hants, September, 1887.

APATURA IRIS IN MAY IN DEVONSHIRE.—On a very hot day, about the 11th of May last, on the top of a high hill close here, and flying rapidly under some tall trees, I caught a male *Apatura iris*, apparently just emerged from the pupa. As this is neither the season nor a recorded locality for this butterfly, I am rather at a loss to account for its appearance, and shall be very much obliged if you can suggest any explanation of it.—F. G. JOHNSON; The Old House, Blundell's School, Tiverton, Devon.

LYCÆNA CORYDON AWAY FROM CHALK.—Adverting to my friend Dr. Rendall's note on this species (Entom. 229), respecting his having taken it at Hounslow on 1st August last, a locality many miles from a chalk formation, so far as my experience goes I have never found *Lycæna corydon* in England except on chalk; but on the Continent the species is by no means confined to a chalky soil; for instance, I have taken it near Aussig in Bohemia amongst the darkest trap-rocks, and in the Alps in the Rhone Valley between Viesch and Brieg, in parts in which I saw no chalk. I have even taken specimens at Zermatt, some 5000 feet above the level of the sea. The Bohemian specimens are larger and darker than the English, the outer third of the fore wings being more suffused with black.—J. JENNER WEIR; Beckenham, Kent.

LYCÆNA CORYDON AWAY FROM CHALK.—An entomologist, in the August number of this magazine, having recorded the capture of *Lycæna corydon* away from chalk soil, I may state that I took a single specimen of this insect in Herefordshire, about twelve miles due north of Worcester, in the middle of August this year. There is no chalk whatever in the neighbourhood; and so far as I can ascertain, *L. corydon* has not previously been observed there.—JOHN LEA; 2, Elm Villas, Hampstead, N. W., September, 1887.

LYCÆNA CORYDON, DWARF SPECIMENS.—While collecting with a friend on the chalk downs, between Lewes and Glynde, we met with a great profusion of both male and female specimens of this butterfly of unusually dwarfed size. Most of the specimens were

less in size than *Lycæna icarus*. They appeared confined to a small spot just by the rifle-butts; for although we saw hundreds on the downs outside this particular spot, they were all of the normal size. Can anyone explain this phenomenon?—A. W. GUSH; Mayfield, Hollington Park, St. Leonard's-on-Sea.

LYCÆNA CORYDON, VARIETIES.—It is more than twenty years since I have had the opportunity of working for *Lycæna corydon* inland, and I was much pleased when my brother, Mr. T. H. Briggs, on the 2nd August, came across the species in the utmost profusion at an inland locality in one of the metropolitan counties. I am thus vague, as it seems now to be the fashion to conceal one's localities for common species. Amongst those he took was a most singular variety of the under side, the fore wings being grey, nicely streaked; hind wings of the obsolete type, with the usual orange ocelli elongated, blind, and tawny. On August 4th my eldest nephew took a very similar variety, and we secured a fine series of dwarf specimens and some partially obsolete varieties. On August 23rd, at the same place, I took a gynandromorphous specimen, and my youngest nephew the finest obsolete variety I have ever seen, which, through a violation of one or two of the commandments, is now in my cabinet. On Sept. 8th they were going over, but many were in brilliant condition, just out. *Lycæna bellargus*, *L. astrarche*, and *L. medon* were flying merrily with them, but without any attempt at illicit intercourse, so far as we observed, thus confirming all my previous experience. I think, in face of the records in the 'Entomologist,' that Mr. South should now tell us who are the entomologists of much experience who maintain (Entom. 81) that *L. corydon* has run its course before the second brood of *L. bellargus* appears, so that we may know in what part of England their experience was obtained.—C. A. BRIGGS; 55, Lincoln's Inn Fields, Sept. 13.

LONDON LEPIDOPTERA.—Mr. Percy Rendall's interesting notes on Lepidoptera in London (Entom. 198) induced me to note the varieties of Diurni observed in a London garden during August of this year. While reading on a garden-seat in a plot of ground belonging to one of the houses in Highbury Place, I observed personally—*Vanessa io* (several), *V. urticae* (several), *Lycæna icarus* (several), *Polyommatus phlæas* (one only), *Pararge megæra* (one only), *Pieris brassicæ* (swarms), *P. rapæ* (very plentiful, but

not so many as *P. brassicæ*), *Macroglossa stellatarum* (two, over a jasmine), *Orgyia antiqua* (swarms). Curiously, no *Vanessa atalanta* have been observed this year, though they have frequented the spot in September for two or three years previously, about three specimens being seen each season. Larvæ of *Smerinthus populi* are plentiful on a poplar tree in the garden; and one larva of *Dicranura vinula* has been found. Of all the flowers in the garden, the jasmine proved the most attractive to insects of all kinds.—HAROLD HODGE; 9, Highbury Place, N.

ADDITIONAL NOTES ON THE DIURNI OF LULWORTH COVE.—On Wednesday, August 16th, 1887, I revisited Lulworth Cove for the purpose of again examining the Lepidoptera of the district. My previous visit was some six days earlier in the corresponding month of last year (Entom. 183). I was fortunate in obtaining a more favourable day on this occasion than on my previous visit, but the wind was far too strong. I first followed along the cliff in the direction of Weymouth, and soon found *Satyrus semele* in great abundance. I afterwards examined a steep chalky hill-side a little further inland, to which I was unable to give any attention last year, and found it inhabited by large numbers of *Lycæna corydon*. Last year I only obtained one specimen of *Satyrus semele* from here; but on this occasion they proved so extremely common that I could have taken large numbers, had I been so inclined. This species is reported by Kirby as "varying according to locality." Some of my own specimens vary as follows:—The spots on the upper side of the front wing on some specimens are considerably larger than those on others; the spot or eye on the anal corner of the hind wing is absent (nearly), whilst the spots on the front wing are unusually big; in others there is no white in the centre of the eyes; the shades of colouring in the female specimens differ very materially. I saw, as on my previous visit, only two specimens of *Melanarge galatea*, so I am inclined to consider them very scarce here. I am not aware of any other records of the occurrence of this insect around the neighbourhood. A pair of *Epinephele ianira*, taken here, exhibit a peculiarly strong olive-green tint, which I have not observed before. On my last visit (1886) I only obtained one specimen of *Lycæna corydon*, but this year I found them abundantly, as mentioned above. I have again

compared my specimens with those delineated on Plates I. and II. of this volume, attached to Mr. South's valuable paper on *Lycænæ*, and find as follows:—The males bear a strong resemblance on the upper surface to Plate I., fig. 9; the under surface is very varied, but mostly resemble the specimen shown on Plate I., fig. 5, but sometimes the spots on the fore wing are scarcely discernible, and in other specimens the spots on the margin of the front wing have no crescent. Females:—Upper surface like Plate I., fig. 11; under side similar to Plate I., fig. 8; but in more than one specimen there is no black speck in the centre of the discoidal spot, it being perfectly white. All my specimens of *Lycæna corydon* were about the average size, except one exceptionally fine male. The varieties of *L. corydon* are so numerous, nearly every district where it occurs having some variety of its own, that it would seem desirable that collectors should compare their specimens with Mr. South's paper, and where necessary note and record any fresh variety they may be fortunate enough to possess. After having thoroughly examined the Weymouth side of Lulworth, I took the opposite direction leading to the coast-guard station. After a careful search I found *Hesperia actæon* in fair numbers on a sheltered spot of some thirty square yards about a mile along the coast, and took some two or three specimens. The local reports as to whether this species is on the increase or decrease vary considerably; some collectors saying it is getting scarce, while others, again, maintain they have not perceptibly diminished. I am inclined to think they have just managed to hold their own; but I am certain of this, that if such wholesale and wanton destruction of this local insect continues in the future as it has in the past, then, at no distant date, we shall have another blank in the already small list of British butterflies. Since my last notes were written, I have heard of a gentleman who professed to having in his collection some scores of this local insect. Surely the Selborne Society, the intention of which is to preserve from unnecessary destruction such objects, might well establish a branch in Lulworth before it is too late.—W. G. McMURTRIE; Radstock, September 3, 1887.

A SUNNY CORNER.—Everyone who has paid attention to the habits of insects must have noticed the manner in which they will select and cling to some favoured little spot, although to *grosser mortal* perceptions it has few or no advantages over near

neighbouring places. An instance of this has just come under my notice, and I have had the pleasure, which was quite new to me, of watching no less than twenty-three of our sixty-four species of British butterflies at play at the same time in a corner of one field,—a spectacle equalling in brilliancy anything I have seen in the tropics. It was a sunny angle of a Dartmoor trout stream. On one hand were endless woods of beech and oak, and on the other the gorse and heather of great "tors" mounting up to the blue sky. Shut in thus from every wind all the butterflies of the district seemed to have accumulated in this entomological Arcadia. The great bunches of the purple loosestrife were haunted by the vivid yellow males of *Gonepteryx rhamni* with their pale milk-and-saffron mates. On the thistle-heads *Vanessa io* and *V. urticae* sunned themselves in brilliant groups; while metallic *Lycænidæ* met in playful rivalry on the patches of the dwarf crowfoot. To swell the list there were all three varieties of the commoner white butterflies; and here and there in the lanes between the alder bushes that choice and dainty little insect the *Leucophasia sinapis* flitted to and fro. *Epinephele ianira* was ubiquitous. Other *Satyridæ*, including *Satyrus semele*, *Pararge egeria* and *P. megæra*, *Epinephele tithonus* and *E. hyperanthes* thronged the path-sides; while on the marshy patches both the species of *Cænonympha* were more or less common. Of insects of more consideration there were two kinds of *Nymphalidæ*,—*Argynnis aglaia* and *A. paphia*; the latter was everywhere,—ragged, for the most part, as if with the brunt of a long hot season, yet lively and striking,—sailing on its tawny wings in and out of the bramble thickets and over the fern clumps in rare abundance; but no doubt the most interesting to a "collector" in this congregation were of the genus *Thecla*. Of these the *Thecla betulæ* were sufficiently numerous on the oak-sprays along the sunny hanger-sides; but *T. quercus* were present in hundreds, dancing round the tall ash bushes in half dozens, the silver-grey of their under wings matching wonderfully, when at rest, the pale gloss of the leaves amongst which they lived. These, with an occasional *Melanargia galatea* and many *Lycæna bellargus*, made a sight to gladden the eye of any lover of these charming little beings, and one which I think worth putting on record.—LESTER ARNOLD; Bedford Park, Chiswick.

CLIMATIC EXPERIMENT ON PUPE OF LEPIDOPTERA.—Some time ago I forwarded the Rev. A. B. Watson, of Edinburgh, who was about to sail for India, some pupæ, with a request that he would kindly furnish me with dates of emergence in latitudes warmer than our own. Writing from the Staff Lines, Karachi, on the 15th of August, 1887, he says:—"I sailed from Liverpool on the 26th February, 1887, and, until we got into the Mediterranean, the weather was cold. Although the days there were bright and sunny, we had nothing which could be called heat until we entered the Suez Canal on the 14th March. There, at mid-day, the temperature in the shade was 82°. On the 17th March one *Pieris rapæ* made its appearance, a second on the 19th, a third on the 20th, and the fourth on the 21st. On the 21st the first *Pieris brassicæ* came out, another on the 22nd, and a third on the 23rd; on which day *Phalera bucephala* came out, followed by two more on the 24th. On the 26th March the first *Euchelia jacobæ* emerged. On the 27th March I landed at Bombay, and the next day I had a *P. brassicæ* out, which I turned loose to enjoy the sunshine of a warmer clime than its own. On the 29th I found two *E. jacobæ* in the box, and they also got their liberty, with another which put in an appearance on the 31st. On the 1st April I sailed from Bombay for Karachi, which I reached on the 3rd. On the 5th April the fifth *P. brassicæ* was out. On the 7th April both the pupæ of *Deilephila euphorbiæ* changed; and the same day the sixth *P. brassicæ* came out, a cripple, and one *E. jacobæ*, also a cripple. This is my record. I think that I have been fairly successful. The greatest disappointment is that *Smerinthus ocellatus* has failed altogether. I looked at the three pupæ the other day, and found them dried up, not a particle of dust even inside them when they were opened. The two *D. euphorbiæ* were fine specimens; but, unfortunately, when they were being dried on the boards, the little red ants got at them and ate up the body of one. We have had very little rain as yet, and the season has been most unfavourable for Lepidoptera. I took three or four specimens of a big *Sphinx* (almost the same as *Acherontia atropos*), and kept them for a long time hoping for eggs, but without success. I took, the other day, two fairly good specimens of *Deilephila livornica*, and I am in hopes of getting larvæ of the Sphingidæ soon. On the 15th of last August one (my first) was brought,

but I do not know what he is. In some years *Chaerocampa nerii* is tolerably common, and *C. celerio* also, but I have not been lucky enough to get them. If we had a good fall of rain it would bring lots of them out. But this part of India, Sind, is not nearly so rich in its butterflies and moths as Bombay is. The country round about is desert, and there are no wooded hills which insects love." The following is a list of the pupæ I sent Mr. Watson:—Three *S. ocellatus*, two *D. euphorbiæ* (not British), eight *E. jacobææ*, four *P. bucephala*, six *P. brassicæ*, and four *P. rapæ*. They were placed in a box on moss, with a light layer of the same material upon them. This upper layer was kept in a slightly damp condition.—J. ARKLE; 2, George Street, Chester, September, 1887.

CURIOUS HABIT OF *MACROGLOSSA STELLATARUM*.—In the course of a suburban ramble that I took on July 16th, about 4 p.m., I noticed a specimen of this insect, apparently dozing in the broad sunshine on the tarred side of a cow-shed. Thinking that I had an easy prey before me, I approached it cautiously with a large glass-topped box; but I soon became aware, by the position of his antennæ, that he was playing with me, for off he sailed a moment later. I had barely bemoaned my ill-fortune in appropriate terms, when to my surprise he returned, and settled within a few feet of his former position. Desirous not to miss him, I opened battle with a net, and, thinking that so lively an insect would certainly fly straight away, struck straight at the spot where he was. The result was that he allowed me to cover him, but before I could closely adjust the ring of my net to the boards he had slyly gone out sideways, and thereby received a second life at my hands, amid shouts of derisive laughter from my companion. My astonishment was redoubled to see him within a few minutes again "located" on the warm black boards. This time, thoroughly on my mettle, I swept sideways for him, and captured him as he flew, on the return stroke, a victim to his rash idiosyncrasy. I have been told by several entomologists, and others, in different counties, that the above insect has been much more plentiful, in their various neighbourhoods, than usual, this dry summer.—PERCY RENDALL; 16, Little Grosvenor Street, W., September 1, 1887.

MACROGLOSSA STELLATARUM IN DUMFRIESSHIRE.—On the 17th July, my friend Mr. Scott, of Whinneyknowe, Moffat, brought me

a specimen of this moth, which had flown in through his drawing-room window the previous night. I do not remember seeing the species recorded from that county before.—FRANK R. JEX LONG; 11, Doune Terrace, Kelvinside, Glasgow.

ABUNDANCE OF *SESIA TIPULIFORMIS* AT CHESTER.—Whilst in the garden of a friend examining some red currant bushes that had been defoliated by the larvæ of *Abraxa grossulariata*, I discovered a number of empty pupa-cases of *Sesia tipuliformis*. They were sticking from holes made in branches of various ages. Next morning, the 25th of June last, from 10.30 to about 12 o'clock, I took two dozen of the perfect insects, some at rest and others on the wing. They were nearly all confined to a row of red currant bushes stretching east and west, and fully exposed to the glare of the sun. Some ivy climbing upon the south wall of an outhouse was also much frequented by the little moths, which sported about in considerable numbers both upon the leaves and in the air above. An adjacent row of red currants stretching north and south was little frequented by them, whilst another of black currant trees seemed entirely ignored. One insect I captured on a pink,—the only flower that *tipuliformis* seemed to care about. At the end of a week the pretty little insects had all disappeared.—J. ARKLE; 2, George Street, Chester.

SPHINX CONVOLVULI.—This moth appears to have occurred more frequently this autumn than usual. The following are records received:—

Cumberland.—At 11 a.m., Sept. 6th, I took *S. convolvuli* sitting on the front of the house. I heard of some workmen close by taking another the day before.—M. ROUTLEDGE; Stone House, Carlisle. On the 31st September a gentleman gave me a specimen of this moth, which he found at rest on the roof of an outhouse.—C. EALES; Cavendish Place, Carlisle.

Yorkshire.—Three males and two females near York on August 27th, 29th, Sept. 4th, 5th, and 7th, four being taken in a greenhouse, evidently attracted by the powerful odour of three tobacco plants (*Nicotina affinis*); the fifth I took from the sail of a barge lying in the River Foss.—ROBERT DUTTON; Castle Mills Bridge, York.

Lancashire.—At Bury, on Sept. 2nd, a female specimen was caught by a boy, flying in a public thoroughfare of this town.—

J. HOWARD HALL; Derby House, Bury. Two specimens near Bolton, one on the doorstep of Astley Bridge Church by the vicar, on August 31st; the other near Horwich, on Sept 4th.—CHAS. E. STOTT; Lostock, Bolton.

Warwickshire.—Two fine specimens have lately been captured in Birmingham. I have myself caught one of the handsome larva of this moth at Sparkbrook, Birmingham.—W. T. RAINE; 43, Newport Road, Sparkbrook, Birmingham.

Worcestershire.—I have been successful in taking fourteen specimens flying round the flowers of *Nicotina affinis*. The first was caught August 27th, the remainder at intervals up till September 9th. — WILLIAM H. EDWARDS; 21 Pitmaston Road, Worcester.

Cambridgeshire.—Two specimens were taken near Cambridge, one in a house in Mill Road on August 19th, and another early in September on the Newmarket Road by a boy.—ALBERT H. WATERS; Willoughby House, Mill Road, Cambridge.

Buckinghamshire.—A fine specimen was taken in a cleft of a tree in Chalfont Park, on August 20th, and brought to me.—J. SEYMOUR ST. JOHN; Chalfont St. Peter, Slough.

Suffolk.—I caught, on September 2nd, at Lowestoft, a perfect specimen of *Sphinx convolvuli*.—F. J. STONEMAN; 43, St. John's Park, Highgate Hill.

Kent.—On Sept. 3rd a labouring man brought me a specimen of *S. convolvuli* in fair condition; I also saw one at rest on a gas-lamp on 7th inst., but was unable to effect a capture.—W. H. CHEESMAN; Rose Villa, Coolinge, Folkestone. A specimen exhibited alive at the South London Nat. Hist. Society's Meeting, Sept. 8th, by Mr. Trimmer Williams, was found on the window of his house, Sidcup, on the same day.—JOHN T. CARRINGTON.

Sussex.—Thirty-five specimens have been secured in my garden here, and in addition to these I have captured and released upwards of twenty specimens. I have also seen a great many others. I only obtained one variety, a female with a broad black bar just above the tail. They appeared the second week in August, and are still on the wing (September 21st).—DOVER A. EDGELL; Firle, near Lewes. On August 29th last a guard at the Groombridge Railway Station presented me with a large specimen. On the evening of Sept. 12th I captured another specimen at a petunia-bed in the garden, very perfect and

apparently just emerged from pupa.—W. H. BLABER; Beckworth, Lindfield. Three were taken at Keymer, but were all faded.—JOHN T. CARRINGTON.

Surrey.—A specimen was taken at Haslemere, August 31st.—T. P. NEWMAN; Springfield, Reigate. A specimen taken by Dr. W. McGeagh at Putney on the 31st August.—JOHN LEA; 2, Elm Villas, Hampstead.

Hampshire.—On Sept. 3rd a dead *S. convolvuli* was brought me by a gardener; so, thinking more might be about, I watched some petunia-beds at dusk on the 6th and 7th, and saw three on the first and another on the latter evening.—WALDEGRAVE; Blackmoor, Petersfield, Hants, Sept. 8th. A fine specimen was taken at Alum Bay, Isle of Wight, on August 30th.—M. A. GRANT. I began to keep a look-out for this species about the middle of August, thinking perhaps that the very dry season would have the same favourable result with *S. convolvuli* as in 1885, but not until the 27th did I see a specimen—a worn male; the next evening I captured a large female in better condition, and two more were brought me, the last on Sept. 12th—a fresh male specimen. I know of a great many taken not far from here about the time I captured my first two, nearly all in poor condition; this and their appearing all in the same week leads me to the belief that these *S. convolvuli* are immigrants.—J. M. ADYE; Somerford Grange, Christchurch.

CALLIMORPHA HERA IN SOUTH DEVON.—While recently staying at Tenby, I felt anxious to renew my acquaintance with my old friend *Callimorpha hera*. I therefore left South Wales for Dawlish on August 13th, and on my arrival began working in earnest. During my week's visit I had the pleasure of capturing six specimens, three of which were the var. *lutescens*. Two more were sent to me subsequently. Compared with last year, I found I was quite a week too late, as my specimens were not in perfect condition; but I was fortunate enough to obtain ova, which hatched in ten days, and I have now the larvæ feeding.—J. JAGER; 180, Kensington Park Road, Notting Hill, London, Sept. 18, 1887.

PUPATION OF COSSUS.—With reference to Mr. W. O. Hammond's remarks last month (Entom. 231), with respect to the pupation of *Cossus ligniperda*, I have invariably found the cocoon in the wood until the present year, when I discovered the pupa-case at a con-

siderable distance from the tree, just below the surface of the earth.—ALFRED T. MITCHELL; 5, Clayton Terrace, Gunnersbury, W., September 12, 1887.

OCNERIA DISPAR, MALFORMATION NOT HEREDITARY.—From one dozen pupæ, obtained in August, 1886, I got five perfect insects, which I killed; the rest were badly crippled, especially the females. From these I obtained about forty-five eggs, which commenced hatching May 12th, 1887. The larvæ were fed on hawthorn and apple till July 9th, when they commenced spinning up. The moths began to emerge July 29th, and, with the exception of two which died in the pupæ, *all* were perfect specimens. They thus showed no hereditary malformation, though they were the offspring of crippled parents.—W. H. EDWARDS; 21, Pitmaston Road, Worcester, September 19, 1887.

NOTODONTA DICTEOIDES DOUBLE-BROODED.—I took a fairly fresh specimen of this moth on a lamp at Hampstead, on 4th September last. Presumably it belonged to a second brood, as the insect appears to be on the wing in June and July.—JOHN LEA; 2, Elm Villas, Hampstead, September, 1887.

ACRONYCTA ALNI NEAR SCARBOROUGH.—A specimen of *Acronycta alni* was taken at rest on some palings near to Seamen Beacon, in the vicinity of Scarborough, by Mr. J. Head, on June 25th.—JAMES H. ROWNTREE; Westwood, Scarborough, September 17, 1887.

ACRONYCTA MEGACEPHALA DOUBLE-BROODED.—About the end of July this year I took a number of the larvæ of this species from the trunks of poplars in Hyde Park. They spun up a few days later, and on the 25th of August I was surprised to find, on looking into my breeding-cage, that one of the moths had emerged. A second specimen emerged on the 28th, and on the 29th I took a perfectly fresh specimen from a gas-lamp in Brixton Road. Newman, in his 'Natural History of British Moths,' makes no mention of a second brood, and gives June as the time of appearance. The remainder of the pupæ seem to have every intention of passing the winter in that state. This unusual emergence may be on account of the recent hot weather.—FRANK R. JEX LONG; 11, Doune Terrace, Kelvinside, Glasgow, September, 1887.

PLUSIA INTERROGATIONIS IN SOUTH WALES.—On the 4th July, while taking moths at light, I captured, among others, a fine specimen of *Plusia interrogationis*, which species I was not aware occurred in South Wales, though I believe it has been occasionally taken in North Wales, as also the more northern counties of England. This season an unusual quantity of *P. chrysitis* and *P. pulchrina* occurred, though not generally common here; also *P. festucae*, which I have not before observed. I have taken all this season in some abundance over ragwort, borage, and hemlock flowers. *Plusia chrysitis* was in the utmost profusion.—S. GRAVES; 29, Victoria Street, Tenby, South Wales.

CIRRHAEDIA XERAMPELINA IN IRELAND.—Perhaps your readers may be interested to hear that on Wednesday last, 24th August, I took, as indicated in the article on autumnal collecting (Entom. 202), a fine fresh specimen of *Cirrhædia xerampelina* drying its wings on the trunk of an ash tree at 5.30 p.m., at Bessborough Park, Co. Kilkenny. I do not think it has been before noticed in this "Emerald Isle" of ours. This is an exceptionally good place all round for the pursuit of Entomology.—F. W. H. WALSH; Carrick-on-Suir, Ireland, August 31, 1887.

CIRRHAEDIA XERAMPELINA AT WORCESTER.—I have taken thirteen specimens this season off the trunks of ash trees. They were all in good condition, having just emerged.—WILLIAM H. EDWARDS; 21, Pitmaston Road, Worcester.

CIRRHAEDIA XERAMPELINA IN SOUTH BUCKS.—My grateful thanks are given to Mr. Carrington for his valuable and timely hints on "Collecting Autumnal Lepidoptera" in the August number of the 'Entomologist,' as well as for some pleasant and profitable hours from them. Wishing to discover *C. xerampelina* here, if possible, I searched the ash trees in Chalfont Park three or four afternoons last month without success until the 27th, on which day I saw with pleasure a fine fellow drying his wings at 5.15. On further search I took five others; and since then, with the kind help of a friend, the captures have been as follows:—August 29th, twelve; the 30th, three; September 2nd, six; the 3rd, one; the 5th, one; but saw no more after that. On the last-named day I found a perfect specimen of *Xanthia citrargo* on the grass within eighteen inches of an ash trunk, and which at the first glance I took to be a *xerampelina*. How it got

there I know not, the larva feeding only on lime. The majority of the twenty-nine taken were found within two feet of the ground on the ash trunks, but some (and I noticed especially on windy days) on the grass within eighteen inches of the trunks. The variety *unicolor* was not among them. If *xerampelina* is looked for in the way indicated by Mr. Carrington, it will become, I venture to think, as common as *Xanthia fulvago* or *X. flavago*.—J. SEYMOUR ST. JOHN; Chalfont St. Peter, Slough, Sept. 12.

CIRRHCEDIA XERAMPELINA IN GLOUCESTERSHIRE.—As an old collector in Gloucestershire of *Cirrhædia xerampelina*, I read with interest your note on collecting that species (Entom. 202). I have taken here forty-three this year, and I have no doubt I might have taken any quantity if I had devoted time to it. I once, in Gloucestershire, dug twenty-four pupæ at one tree, and then found several imagines on the same tree. I have often wondered if *Dasycampa rubiginea* could be found in the same way. There are many oaks here, and I mean to look this year. I was some years ago in Devonshire, and dug seventeen pupæ of *D. rubiginea* at one tree. *Hadena protea* may be found in quantity in the same way as *C. xerampelina*, and also *Polia chi*. I find the *C. xerampelina* earlier in the day than you mention, from 11 to 3 p.m.—E. HALLETT TODD; Stretton-en-le-Field, Ashby-de-la-Zouch, September 10, 1887.

ON XANTHIA FULVAGO VAR. FLAVESCENS.—I have somewhere seen written, and often heard stated, that the var. *flavescens* of *Xanthia fulvago* is much more frequently bred from larvæ found feeding in the catkins of osier (*Salix viminalis*) than in those from the common species of that genus (*S. caprea* and *S. cinerea*), and to account for this the theory is advanced that this form being uniform yellow in colour approaches much nearer in tint the autumnal leaves of *S. viminalis* than typical specimens, and thus being better concealed from its enemies by the process of natural selection is gradually becoming itself the type of the local races, the larvæ of which feed upon this plant. Now this is all very beautiful in theory, and if a fact is a most interesting and instructive one; but it seems doubtful (as far as the experience I have been able to gather shows) whether it will bear examination. It may be remarked that *Xanthia fulvago* is a very widely distributed and also a strong flying species, and as several varieties of

sallows are universally common it is probable that a race occurring in a locality where the osier grows would not confine itself solely to this plant, but would feed in a large number of generations upon other species of the same family. Now as natural selection is an extremely slow process it would probably require a great number of generations on one line of descent of osier-fed specimens to produce a marked departure from the original type, and as a large number of individuals of this line in each generation would undoubtedly wander to and from this food-plant, the tendency to favourable variation acquired in one generation would be neutralised in the next, and so on. Some seven or eight years I have bred this species from willow catkins gathered in various localities; the average number of specimens has been, say, five dozen per annum, and of the variety (excepting one season) about two per cent. of the total number. On several of the above occasions my catkins were gathered from Breadsall Moor, near Derby, and from these alone did *flavescens* emerge. In the spring of 1885 I collected about a pint of catkins, and bred from them fifty-three specimens, of which no less than eighteen were this variety. These came from the same bush off which I had several times previously taken catkins, with first-mentioned result. I have often asked entomologists who have bred this species from osier-fed specimens if they have been more successful than myself in procuring this variety, but have not met with anyone who has. From the above observations it would appear that *Xanthia fulvago* var. *flavescens* is a local form and to a very large extent hereditary, for only on the assumption that the parent moth which deposited the ova on catkins collected in 1885 was this form can one account for the large number of it emerging that year.—W. G. SHELDON; Rose Cottage, Oval Road, Addiscombe, August 13, 1887.

ABRAXAS GROSSULARIATA, VAR.—During May I collected two or three hundred larvæ of *A. grossulariata*, and bred a most peculiar variety with no white in it at all, but where the white is in the ordinary specimens, is yellow, like the usual transverse band. I see no account of such a variety in Newman's work, so thought it might interest your readers.—R. B. ROBERTSON; New Lodge, Hartley Wintney, Winchfield, Hants, August 29, 1887.

CLEORA ANGULARIA IN HANTS.—I had the good fortune to get with a specimen of *Cleora angularia* (*viduaria*) in the New

Forest on June 24th. It is a male, and in fine condition.—
EDWARD BUCKELL; Romsey.

MACARIA LITURATA, VARIETY.—I have taken, at Delamere Forest, what I believe to be a good variety of *Macaria liturata*. The following is a rough description of the insect:—All the wings are dark smoky brown, almost black, with a broad distinct band of dull ochre; hind margin of all the wings decidedly darker than the rest of the wing; there are no costal markings, or the slightest trace of them.—ROBT. NEWSTEAD; Curator, Grosvenor Museum, Chester, July 10, 1887.

PERIDEA TREPIDA.—In answer to R. S. Williment's question concerning the fecundity of this insect (Entom. 159), I may say I took a male and female on the bole of an oak in a wood near Colchester on May 21st, 1880. The female laid fully 300 ova. In the following year, on the 25th of May, in the same wood, I took at rest on another oak-trunk a much worn male, which I placed in a cage with a newly-emerged female from the progeny of the pair taken in 1880. This female also laid fully 300 ova. But this year, from a bred pairing, I was only enabled to obtain 225 ova, which diminution in number may be accounted for by declining vigour in the race consequent on the parents having been inbred of the second generation. Probably in a state of nature 300 would about represent the maximum number of ova laid by the female of this species.—GEO. J. GRAPES; 2, Buckleigh Road, Streatham Common, S.W.

RETINIA PINICOLANA IN THE ENGADINE.—On Saturday, 6th August, I entered Pontresina by the Bernina Road, and was at once struck by the singular appearance of the pine trees. For many miles, as far as the eye could reach, the firs, instead of presenting their usual cool green aspect, were completely brown and withered from root to top. Thinking that this was unusual, and putting it down to the severity of the late winter, I made enquiries as to the cause of the catastrophe, for it was nothing less. I was given to understand that the dead-looking appearance of the trees was due to the ravages of the larva of a minute moth, which, upon investigation, turned out to be *Retinia pinicolana*. This was corroborated by an interesting account of insect pests, which I found in a little book, by Dr. Ludwig, about Pontresina and the environs. He states that the valley has been subject in like manner to visitations from the same insect, and that in 1868

and 1876—I quote from memory, and may therefore be wrong as to the actual years—the same thing took place. Sunday, 21st, August, dawned with a heavy snowstorm, and on a walk to the Morterasch glacier I found hundreds of the imagines lying frozen upon snow. As many of the trees never recover, the inhabitants are naturally anxious to find a remedy; but so far their efforts have been unavailing. I travelled over the Albula pass with a German naturalist, who informed me that the same insect had been making sad havoc among the pine trees on the beautiful Riffel Alp, at Zermatt; but these are the only localities I have heard of in Switzerland where the damage done amounts to anything serious. I never saw *Parnassius apollo* in such abundance or in such magnificent condition as this year. In the Tyrol it simply swarmed. I saw one very pretty variety, in which the ruby spots on the hind wings were united by a delicately-pencilled black line. This had been taken at Bergun by Mr. Sigdtmund, a naturalist resident there.—H. ROWLAND BROWN; Oxhey Grove, Stanmore, Middlesex, Sept. 2, 1887.

LONDON LEPIDOPTERA.—I was glad to see that some remarks and conjectures I had ventured to make were approved and confirmed by Mr. C. J. Biggs and Prof. R. Meldola (Entom. 234, 235), entomologists who are better qualified than I am for such a discussion. With respect to the latter's note, I may mention that whilst my remarks were in the press, I noticed *Lycæna icarus* in Ladbrooke Square, though in previous years it had not been observed; *Cosmia trapezina*, also, has since been added to my list. I can also add my testimony to the fact that *Hyponomeuta padellus* was more plentiful than usual this year. There is already in my possession a respectable nucleus of London Tineæ, though up to the present time I have refrained from entering into particulars, hoping to augment the number of species. As regards Mr. Biggs's interesting note on the marked diminution of insects generally in the metropolitan district, I have lately obtained a list of captures made thirty years ago by a friend of mine, whilst residing in the north of London, which includes many, now, scarce species. Since it appears that a considerable amount of public interest is now being evinced in the matter, and that no one is engaged in drawing up a list of the London insects, I am encouraged to devote myself to the task, with a view to publication in 'the Entomologist,' especially as I am assured by the Editor

that I may safely count upon a number of competent helpers, which would prevent the responsibility from being too onerous. The task is surely one possessing scientific interest, that would become enhanced as time rolls on; sources of information are passing away from us day by day. The largest city in the world has a right to expect that its fauna should be accurately chronicled by the energy of its citizens, so that entomologists of the future may have data to which to refer, showing clearly what insects had been able to boast:—"Civis Romanus sum." The limit I propose to make is that of the outer cab radius, which is clearly indicated on most maps of the metropolis, *i.e.*, six miles from Charing Cross, the centre; and I should be glad to receive any properly authenticated records of captures of Lepidoptera, with dates, within this area, if correspondents would be good enough to forward the same to me, at the address given.—PERCY RENDALL, M.D.; 16, Little Grosvenor Street, W., Sept., 1887.

LEPIDOPTERA IN SOUTH WALES.—About the middle of August I spent some time in South Wales, at Tenby, and was successful in taking some good Noctuæ. In one night I took a long series of *Stilbia anomala*, *Agrotis ripæ*, *A. vestigialis*, *A. obelisca*, *A. præcox*, and others. *Agrotis lucerneæ* was also common, but very much worn. Sugar proved a failure this year, which I regretted, as *Polia xanthomista* var. *nigrocincta* and *Triphæna orbona* (*subsequa*) had been taken in the same locality two years ago. I may mention that the second brood of *Lycæna argiolus* occurred in South Wales and Devonshire in greater numbers than I had previously observed.—J. JAGER; 180, Kensington Park Road, Notting Hill, London, W., September 18, 1887.

LEPIDOPTERA NEAR ELY.—The months of May and June seemed to be singularly fused this year, and it was impossible to conjecture in the middle of June what would be the result of any day's captures. It was lamentable to see how small and backward the larvæ generally were in the month of June; and with the drought staring us in the face, the result will not be favourable for the season of 1888. In proof of the above remarks, I give the result of two days' experience this year, on the 10th and 17th of June. On the former day, in two hours and a half I secured thirty *Bankia argentula* and saw *Hydrelia uncula*, and several *Euclidia mi*, *E. glyphica*, *Phytometra viridaria*, *Bapta temerata*, *B. bimaculata*, and *Strenia clathrata*. I saw *Melitæa aurinia*, but

unfortunately missed my solitary chance at it. I secured two larvæ, full-fed, of the beautiful *Plusia chryson*. On the 17th of June I was most fortunate in four hours and a half securing from two to ten specimens of the following:—*Euchloë cardamines*, *Argynnis euphrosyne*, *Pararge egeria*, *P. megæra*, *Cænonympha pamphilus*, *Thecla rubi*, *Nemeobius lucina*, *Syrichthus malvæ*, *Nisoniades tages*, *Hesperia comma*, *H. sylvanus*, *Carterocephalus palæmon*, *Macroglossa fuciformis*, *Ino statice* (in abundance), *Nemeophila plantaginis*, *Euclidia mi*, *E. glyphica*, *Heliaca tenebrata*, *Cabera pusaria*, *Asthena sylvata*, and single specimens of *Larentia* and *Eupithecia*. I may mention that all the above were fresh. It was very hot work, but I felt rewarded by the extreme variety of my captures.—HAROLD ARCHER; "The Close," Ely.

NEW FOREST NOTES.—On the 18th of July I took up my quarters at Brockenhurst for ten days' collecting. The weather was everything that could be desired, from an entomological point of view, which probably in a great measure accounted for the results comparing very favourably with those of the past two or three seasons. The Diurni were out in great force. *Argynnis paphia* and *Limenitis sibylla* were everywhere abundant. I have never seen either species so plentiful before. *Gonepteryx rhamni* and *Thecla quercus* occurred commonly, and a long series of *Vanessa polychloros* was taken. This species usually occurs very sparingly. The abundance of *Pieris rapæ* was particularly noticeable; it apparently almost displaced *P. napi*, of which I only observed one specimen. *Apatura iris*, although rather local, was not at all uncommon, and I had much pleasure in taking this grand insect for the first time. Five specimens only were netted, not without considerable patience and a good many disappointments. I was particularly struck with their partiality for the spruce-firs. Very few were noticed flying round the oak. On one day in particular I saw quite twenty specimens sailing along by these firs, and frequently alighting upon the cones, which had been moistened by a fine rain in the morning. The cones were evidently very attractive, for nothing but the appearance of a female would bring his imperial majesty within reach of an ordinary net. By trunk searching a nice series of *Liparis monacha* was taken (including some handsome dark forms); also *Nola confusalis* and *Boarmia repandata* (var. *conservaria*). Sugaring was at first very disappointing, but later on *Amphipyga*

pyramidea occurred in great profusion, from sixteen to twenty specimens being frequently observed upon a single tree. On the other hand, such common species as *Xylophasia monoglypha*, *Noctua xanthographa*, *Tryphæna pronuba*, and *Cosmia trapezina* only appeared very sparingly; also *Gonophora derasa*, *Leucania turca* (worn), *Aplecta prasina*, *A. nebulosa*, *Catocala promissa*, and *C. sponsa* (one only), but later on it was taken in large numbers. I did not find the heaths very productive. An expedition after *Acidalia straminata* and *Selidosema ericetaria* was unsuccessful, but *Satyrus semele*, *Lycæna ægon*, *Pseudoterpna pruinata*, and *Agrotis strigula* were plentiful. Very few Geometers put in an appearance at dusk. Among those taken were *Epione apiciaria*, *Ellopiæ prosapiaria*, *Pericallia syringaria*, *Crocallis elinguaris*, *Ennomos angularis*, *Cleora lichenaria*, *Gnophos obscuraria*, *Phorodesma pustulata*, *Ligdia adustata*, *Melanthia albicillata*, *Coremia designata*, *Scotosia dubitata*, *Cidaria picata*. Among the larvæ thrashed out were *Selenia tetralunaria*, *Ennomos tiliaria*, *E. angularis*, *Amphydasis strataria*, *Deprana lacertinaria*, *Stauropus fagi* (very small), *Notodonta dromedarius*, *N. chaonia*, *N. trimacula*, *Cymatophora ridens* (a few, mostly ichneumonid), *Acronycta tridens*, and *A. leporina*. I understand that *C. ridens* had been unusually abundant. On the whole I think the present season, in the New Forest especially, has been a great improvement upon any since that of 1881, which, if I remember rightly, followed a long and severe winter, such as the last experienced. —ALFRED T. MITCHELL; 5, Clayton Terrace, Gunnersbury, W., Sept. 12, 1887.

MOTHS SETTLING ON WATER.—In the 'Entomologist' (p. 225), Mr. H. G. Sheldon notices the fact that he has found Lepidoptera capable of rising from the surface of the water on the salt-marshes of Shoeburyness. Perhaps it may be of interest to relate that while watching the lake of St. Moritz I was surprised to notice the movements of a certain Geometer, very common in the adjacent pine woods. It apparently took great pleasure in the water, and hundreds of them might be seen dipping like swallows upon the surface. Several, however, ventured yet farther, and lay with their wings extended almost on the water, but apparently found no difficulty in directing their flight upward when disturbed in their bath.—H. ROWLAND BROWN; Oxhey Grove, Stanmore, Middlesex, September 2, 1887.

LARVA RAPIDLY CHANGING COLOUR.—I wish to ask whether it is known that a lepidopterous larva can change its colour rapidly. I was walking in our garden here to-day in company of my wife, and detected a larva (that of a *Noctua*) busily engaged in devouring the flower of a marigold. I picked off the flower, the larva being attached, and showed it to my wife, the larva being then a dull brown. In the course of two or three seconds it became evidently to us both a decided blue, and, before I had reached the house with it, again became brown. I do not know the species of larva, but it is in the breeding-cage still at work on the marigold, and remains brown. The swarms of "whites" here have been phenomenal, and in the clover fields nearly every flower-head has been conspicuous by its rifling *Pieris*.—WINDSOR HAMBROUGH; Hamilton House, Odiham, Hants, Sept., 1887.

PRESERVATION OF NEUROPTERA.—In the 'Entomologist' (p. 115) the Rev. Dr. Walker asked if any of your readers could inform him how to preserve the colours of Neuroptera, but I have seen no reply, and by what I read and hear there is no way known by which the splendid colours of these insects can be preserved. Though I am not confident of having overcome the difficulty, yet I venture to say the following will be found to be of some use:—Cut open the ventral side of the abdomen and thorax with a small pair of scissors, and extract the contents immediately the insect is dead; then drop into the cavity some drops of benzine, or, as my bottle is labelled, "benzole rectified," and shake in some carbonate of magnesia to absorb the spirit and grease; a few minutes afterwards the magnesia can be removed by blowing, and brushing with a camel's-hair brush; the quicker and more thoroughly the contents are removed the better, after the insect is dead. With this post I send you a male and female of a species of dragonfly, *Cordulegaster annulatus*, thus treated, that you might see the result. They have been done nearly two months. The smaller species of Neuroptera require careful handling, but with a little practice that difficulty will be overcome. The best way, or rather the way I kill them, is by dropping two drops of chloroform on the under side of the thorax of the large dragonflies, which kills them instantly; and one drop is sufficient for the Demoiselle (*Calepteryx splendens*), which fortunately does not fade nor shrink. An hour or two should elapse before they are set, as the chloroform makes them stiff for a bit. You will see

that I have stuffed them by laying in stems of dry grass, by which means they can be very quickly done. I was led to try this plan by having a dragonfly sent me last year with the abdomen, by some means or other, empty, and the colours not much faded.—F. MILTON; 164, Stamford Hill, N., September 15, 1887.

[Our correspondent favoured us with an examination of the specimens to which he refers, and we may say that their preservation seems decidedly in advance of anything we have seen.—ED.]

SIREX GIGAS IN NORTH WALES.—A fine specimen of this handsome sawfly was taken recently at Nantyn Hall, near Llangollen, by Colonel Webb, of Lyncroft, Lichfield.—JOHN T. CARRINGTON; September, 1887.

CORDULEGASTER ANNULATUS, &C., IN WYRE FOREST.—I visited Wyre Forest on several occasions during July, and met with *Cordulegaster annulatus* in the neighbourhood of Derule's Brook, of which insects I have taken a grand series altogether. At Earl's Wood, in June last, I saw *Agrion minima* in immense abundance; and at Stratford-on-Avon, in July, I was able to collect a nice series of *Agrion pumilio*. Very little is recorded about dragonflies; so I thought that these few notes might be interesting to collectors of these insects.—W. HARCOURT BATH; Ladywood, Birmingham.

ICHNEUMONS AND THE HOT SUMMER.—With regard to the interesting point raised by Mr. McMurtrie (Entom. 228), as to the effect of the great heat on ichneumon flies, I regret to say that I have been forced to arrive at a very different conclusion from his, as I have never known larvæ so terribly subject to the attacks of ichneumons as in the late exceptionally hot and dry summer. It is only fair to state that my work has for the most part consisted in rearing Micro-Lepidoptera, but the disappointments I have had to bear have been endless; and larvæ, whether of single- or double-brooded species, seem to have suffered equally from the attacks of these pests. Looking back on my experience of this season, I am led to believe that the great heat and drought, while favourable to lepidopterous larvæ in general, have been especially favourable to the parasites which prey upon them. As regards the late extraordinary abundance of *Pieris brassicæ* and *P. rapæ*, if, as seems probable, their numbers are in a great measure to be accounted for by the immigration of large flights from the Continent, the phenomenon is easily explained;

whilst in the case of the second brood, it is surely not to be expected that our native stock of ichneumons would be able to cope with the hosts of larvæ resulting from such an exceptional visitation.—EUSTACE R. BANKES; The Rectory, Corfe Castle.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—Sept. 7, 1887. Dr. Sharp, President, in the Chair. Mr. Arthur Sidgwick, M.A., Fellow of Corpus Christi College, Oxford, of Woodstock Road, Oxford, was elected a Fellow of the Society. Mr. Jenner Weir exhibited a living larva of *Myrmeleon europæus*, which he had taken at Fontainebleau, on 6th August last. Mr. Elisha exhibited a series of bred specimens of both sexes of *Zelleria hepariella*, Stn.; and also, on behalf of Mr. C. S. Gregson, a series of eighty varieties of *Abraxas grossulariata*, selected from the specimens bred during the year 1886 from 4000 larvæ obtained from eggs laid by selected varieties, the results of crossing and interbreeding for more than twenty years. Mr. Stainton remarked that the female of *Zelleria hepariella* had until lately been considered a distinct species, and was known as *Z. insignipennella*, but directly Mr. Elisha began breeding the insect its identity with *Z. hepariella* was established. Mr. Tutt exhibited specimens of *Crambus alpinellus*, *C. contaminellus*, *Lita semidecandriella*, *L. marmorea* (dark forms), and *L. blandulella* (a new species), *Doryphora palustrella*, and *Depressaria yeatiana*, all collected at Deal during last July and August. Mr. Stainton observed that *Crambus alpinellus* was so named from the earliest captures of the species having been made on the lower parts of the Alps, but that it had since been found on the low sandy ground of North Germany; and its capture at Deal quite agreed with what was now known of the distribution of the species in Germany. It was first recorded as a British species by Dr. Knaggs in 1871, from two specimens taken at Southsea by Mr. Moncreaff. Mr. Stainton further observed that he had named Mr. Tutt's new species "*blandulella*" from its similarity to a small *maculea*, of which one of the best known synonyms was *blandella*. He also remarked that Deal was a new locality for *Doryphora palustrella*, which had hitherto only been recorded from Wicken Fen and the Norfolk Fens in England, and from the neighbourhood of *Stettin* on the Continent. Mr. Waterhouse exhibited, on

behalf of Mr. Coote, a variety of *Lycæna phlæas*; also a number of *Stenobothrus rufipes*, and three specimens of *Coccinella labilis*, recently taken by himself at Herne Bay. Mr. Martin Jacoby exhibited specimens of *Spilopyra sumptuosa*, Baly, and *Sybriacus magnificus*, Baly. He also exhibited several species of *Galerucidæ*, belonging to a genus which he proposed to call *Neobrotica*, closely resembling in shape and coloration certain species of *Diabrotica*, but differing therefrom in structural characters. He remarked that the late Baron Von Harold had described a *Galeruca* from Africa, which, except in generic characters, exactly resembled the South American genus *Dircema*. Dr. Sharp communicated a paper, by Mr. Thomas L. Casey, "On a new genus of African *Pselaphidæ*." Mr. Bridgman communicated a paper entitled "Further Additions to the Rev. T. A. Marshall's Catalogue of British *Ichneumonidæ*." Mr. Distant read a paper entitled "Contributions to a Knowledge of Oriental *Rhynchota*." Mr. Enock read notes "On the Parasites of the Hessian Fly," and exhibited specimens of injured barley. A discussion ensued, in which Dr. Sharp, Mr. Jacoby, Mr. Billups, Mr. Waterhouse, and others took part.—H. Goss, *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—August 25th, 1887. R. Adkin, F.E.S., President, in the chair. Mr. Cooper exhibited *Argyrolepis ceneana* from Essex. Mr. Mera, examples of the summer emergence of *Tephrosia crepuscularia*. Mr. West, *Acidalia ornata* (bred). Mr. Sheldon, *Catoptria candidulana*, *Retinia buoliana*, and *R. pinicolana*. Mr. Wellman, *Agrotis cursoria*, from Burton-on-Trent; *Noctua festiva*, var. *conflua*, from Perth; and *Plusia chryson*, from Newmarket. Mr. Dobson, *Psilura monacha*, *Selenia tetralunaria*, *Eugonia erosaria*, *Amphipyra pyramidea*, &c., bred from larvæ obtained at the New Forest. Mr. Barron, a large specimen of *Polyommatus phlæas*, with broad border to fore wings. Mr. Tugwell, *Boarmia abietaria*, bred from larvæ beaten out of yew. Mr. Tutt, a *Gelechia* of doubtful species; a short series each of *Depressaria yeatiana*, *Doryphora palustrella*, *Crambus contaminellus*, *C. alpinellus*, dark forms of *Lita marmorea*, and a new species *Lita blandulella*; also a blackish *Depressaria*, which Mr. Tutt stated could not be identified as belonging to any of our known British species. Mr. Sabine, *Lycæna icarus*, males of varying blue tints, blue females, and a dwarf male barely

three-fourths of an inch in span, under side with confluent spots, and an under side of male with left wings normal and right wings of the obsolete type; also males of *L. bellargus*, of various shades of colour, and females more or less blue; a fine series of hybrids (?), male and female, between *icarus* and *bellargus*; also forms and varieties of *L. corydon*. Mr. Billups read a letter from Mr. Cockerell, giving notes on the fauna of West Cliff, County Custer, Colorado, and exhibited specimens of Lepidoptera from that district.

September 8th.—T. R. Billups, F.E.S., in the chair.—Mr. J. T. Williams exhibited a small specimen of *Drepana binaria*, and remarked on the number of dwarfed specimens of Lepidoptera to be seen this year, which he attributed to the dryness of the atmosphere and consequent dryness of the food-plants. A discussion ensued, in which Messrs. Billups, Carrington, Wellman, and others took part. Mr. Williams also showed a specimen of *Sphinx convolvuli*, taken on his bedroom-window at Crayford, and asked whether the species deposited its eggs in the autumn or following spring. Mr. Carrington said he did not remember hearing of any hibernated specimens of the insect being taken in the spring, and would conclude from this that the ova were deposited in the autumn. Mr. Sheldon exhibited long series of *Agrotis agathina* and *Noctua castanea*, taken on heather-flower at Shirley. Dr. Rendall, *Apamea gemina* and *Hadena dissimilis*, and contributed notes. Mr. Wellman, varieties of *Zygæna filipendulæ*, from Dover. Mr. Dobson, *Emmelesia albulata*, Schiff., var. *thules*, Weir, and various Tortricids from the Shetland Isles. Mr. E. Joy, two melanic varieties of *Vanessa urticæ*, bred from larvæ found at Folkestone. Mr. Tutt, varieties of *Agrotis tritici*, taken at Deal, 1887. Mr. Carrington exhibited pupæ of *Dicranura vinula*, formed among cotton-wool. Mr. Billups stated that several larvæ of this species had been found in the churchyard of St. Saviour's Church, Southwark. Mr. West (Greenwich), *Rhantus pulverosus*, *R. notatus*, the red variety of *Agabus bipustulatus*, and *Philonthus punctus*, all from Erith. Mr. Carrington, specimens of the Hessian Fly (*Cecidomyia destructor*), and a discussion took place as to the probability of this insect becoming permanently established in this country. Mr. Billups exhibited, on Mr. Cockerell's behalf, species from County Custer, Colorado, and contributed notes.—H. W. BARKER, Hon. Sec.

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[No. 294.]

ACIDALIA IMMORATA, L., A SPECIES NEW TO BRITAIN.



ACIDALIA IMMORATA, L.

ON June 27th last, Mr. C. H. Morris, of this town, showed me an insect, of which he had just caught two specimens on some heathy ground in this neighbourhood. When alive in the chip-box the insect somewhat resembled the female of *Fidonia atomaria*, to a form of which I hesitatingly referred it. Subsequent examination of the two specimens (which proved to be male and female) showed clearly that it was not that species, and that it was evidently new to the British List. I have recently, thanks to the assistance of Messrs. Waterhouse and Kirby, been enabled to compare the insect with types of *Acidalia immorata*, L., collected by Prof. Zeller, in the National Collection at South Kensington, with which it agrees in every respect.

Acidalia immorata, L., Syst. Nat. x. 528, is widely distributed on the Continent. Staudinger's List gives the following distribution :—

“Europe, Central and North—exclusive of the Polar Regions and England; Italy, Bulgaria, Russia, Bithynia, Siberia, east and north.”

It occurs in Holland according to Snellen, ‘*De Vlinders van Nederland*,’ p. 563; and Berce, in ‘*Faune Entomologique*

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Francaise,' says it occurs in "Basses Alpes, Auvergne, Alsace, Bourgoyne—but not in environs of Paris."

Berce places it in the genus *Strenia*, with which its affinity is evident; but according to Staudinger's arrangement it should stand in our lists close to *Acidalia emarginata*.

Its food-plant is *Calluna vulgaris*, and it was among this plant that the two specimens here mentioned were taken. It is probable that if places where *Calluna vulgaris* grows abundantly are well worked about the end of June or beginning of July the insect will be found in other localities.

J. H. A. JENNER.

4, East Street, Lewes, Oct. 11th, 1887.

NOTES ON THE NOTODONTIDÆ.

By THE REV. BERNARD SMITH.

No. 3.—*STAUROPUS FAGI*.

OBSERVING many discrepancies in the accounts of this singular insect, I wish to record the result of my own observations.

The moth emerges about the middle of June in our beech woods, but is rarely found. A female, however, taken into a wood and hung up in a cage of muslin will attract many males, between 11 p.m. and 1 a.m. on a warm night, showing that the insect is more plentiful than it seems. It was in this way that the black variety was discovered here.

The insect is, however, difficult to pair, and the second night after the female has emerged seems the only favourable one. In the woods the eggs are at first white, laid singly under a leaf of beech or oak, and may occasionally be found in shady spots. I have never found a second one on the same bush. The egg turns almost black before hatching, and the larva appears lobster-like from the first, or rather resembling an ant. It has not been observed to eat before its first moult.

Stauropus fagi larvæ are found on oak, beech, hazel, and birch, and have even occurred on wild rose and hawthorn. It will also thrive well on apple. The larva is not often cannibal, though instances have occurred. It is certainly pugnacious, if kept in close quarters, and will not bear want of fresh air.

When full-fed, about September, it falls from its food, and

spins up between leaves, forming a tough cocoon, which should not be opened at least before June. There is no necessity to keep the cocoons out of doors, but a moderately damp atmosphere is desirable. Some cut the end of the cocoon open about the beginning of June, as the imago sometimes cannot get out readily, especially if the cocoons are too dry; if not cut, to expose the cocoons to a shower of rain early in June is a good practice. This moth usually emerges about 10 p.m., and should be reserved till the following evening to dry its wings thoroughly. It is then less liable to grease.

The larva is best found by search on small beech trees during September, and there is a dark variety, which, however, does not produce the black variety of the moth. This seems rather to belong to larvæ from hilly and late localities, such as Booker, about three miles to the north of Marlow. The progeny of the black variety is not notably darker.

This pupa does not lie over to a second season. The dark variety of this moth is, as a rule, smaller than the type.

This species occurs in all the woods about Marlow, in Bucks, Berks, and Oxon, and the larva is taken, though sparingly, every year, chiefly in September, by searching for it on the small branches of the beech, confining the search to the wood and not the leaves. When looking for the larva of *Limacodes asellus*, on the contrary, the searcher must look at the leaves, not the wood; so much so, that in looking for one you seldom find the other. The larva of *S. fagi* is also not unfrequently found on the hazel by boys when nutting.

"But are you *sure*," said I to a boy who brought me a fine larva of *S. fagi* from nut, "that the larva ate the leaves of the nut, or had it merely fallen from the beech above?" "Oh!" he replied, "it had eaten a *great hole* in the bush. That was how I found it."

Marlow, September 20, 1887.

THE LITA GROUP OF GELECHIIDÆ.

BY JAMES W. TUTT, F.E.S.

In the 'Entomologist' (pp. 28—30) is published a note of mine, referring to the *Lita* group of the Gelechiidæ found on the

Deal sand-hills, together with an appeal for information. As I have since obtained a good deal of information about the group, it may be of value to some of our micro-lepidopterists if I attempt to explain what I have made out.

There seems little doubt that my note has brought this difficult group to the front, two new species having since been differentiated, and I have already mentioned incidentally (Entom. 213) that I am indebted to many of our leading lepidopterists for their kindness in helping me, both with specimens for reference and with information.

Referring to my previous paper, the form described as No. 1 (Entom. 29) has been decided by Mr. Stainton to be a new species, and this will be described in an early number of the Ent. Mo. Mag., under the name of *Gelechia (Lita) blandulella*. *Blandella* is a synonym of *maculea*; and as the species bears a close superficial resemblance to *maculea* but is very much smaller, the name *blandulella*—"the pigmy *blandella* (*maculea*)"—is very appropriate. No. 2 form (Entom. 29) must, so far as I at present can determine, be considered a variety of *blandulella* with the black oblique line obsolete. This form is much like *knaggsiella* (which has the black line broken), but with the two species side by side one can readily see the difference.

I mentioned that No. 1a, an intermediate form, was named *knaggsiella* by Mr. Coverdale. I have since received specimens of the true *Lita knaggsiella*, bred by Herr Hoffmann, of Hanover, from *Stellaria holostea*, which he kindly gave me for comparison. These I compared with Mr. Stainton's magnificent series and some of the original British specimens, which Mr. C. G. Barrett kindly sent me. Although the specimens of *knaggsiella* that I inspected varied slightly *inter se*, the species has very distinct characters, and cannot easily be confounded, when once seen, with the allied species. My form No. 1a certainly is not *L. knaggsiella*, but consists of very pale specimens of *semidecandriella*, which has lately been differentiated by Mr. Threlfall. As specimens of *semidecandriella*, with perhaps a few *blandulella*, have been sent out from the S.E. coast for *knaggsiella*, the existing series of this latter species want overhauling, and there seems but little doubt that Mr. C. G. Barrett's few original specimens (Entom. 111) still stand unique as British. No. 3 was rightly called (Entom. 29) *semidecandriella*. This is the

typical form, but the specimens of this species vary in intensity both of colour and markings. About No. 4 I will say but little. The markings are so very indistinct that, after all the inspection I have given them, I am undecided. Mr. C. G. Barrett thinks the specimens are "dark vars. of *marmorea*." Probably he is correct.

The following summary may be of some use. It shows what are to me the salient points of these closely allied species. I class the species in pairs, which, in themselves, show but little difference except in size and different character of their respective localities:—

1. *L. maculea*.—Large, white, wood species.
L. blandulella.—Small, white, coast species.
(In both oblique black line whole).
2. *L. hubnerella*.—Large, white, grey-marbled species.
L. knaggsiella.—Small, white, grey-marbled, wood species.
(In both oblique black line broken).
3. *L. maculiferella*.—Inland, hedge species; food unknown.
L. semidecandriella.—Coast species; food *Cerastium semidecandrium*.
(Both dark species; oblique line whole).

This is only, of course, meant to be a very rough guide, but sometimes hints of this kind put one on the right track.

There is another species about which there is some uncertainty, I mean *Lita junctella*. This seems essentially a wood species. The original specimens came from Epping and Hainault Forests (*vide* Sta. Manual, vol. ii. p. 339). Messrs. Hodgkinson and Threlfall get specimens, referred to the species, on the coast of Lancashire. Their species hibernates; the only one of the group as yet known to do so. I asked both these gentlemen for the loan of specimens, but they get scarcely any; and although Mr. Hodgkinson could not let me have one, Mr. Threlfall kindly sent me a fine specimen, which I compared with Mr. Stainton's long series of British and Continental specimens. Mr. Stainton was as decided as myself that this specimen was not *junctella*. The original error must have arisen from the statement that a single specimen submitted to Mr. Stainton "might be *junctella*." I have specimens now, I believe, from Deal, quite identical with Mr. Threlfall's coast species (hitherto called *junctella*); so that

probably this form is another coast species, apparently bearing the same relation to the wood species, *junctella*, that the new coast species, *blandulella*, does to the wood species, *maculea*. This is only thrown out as a suggestion for future investigation.

I may add that Mr. Nelson Richardson has sent me a lovely bred series of *Lita leucomellanella* from Weymouth. The white markings, upon which Mr. Stainton relies very much, are very variable, and in some almost obsolete. I believe this is the only genuine difference between *leucomellanella* and the closely-allied *vicinella*. I see, too, that many of our micro-lepidopterists bracket *vicinella* and *leucomellanella* together, thus suggesting that they are but one species, and that *vicinella* is an obscurely-marked form of *leucomellanella*. Is this the reason? If not, will one of them kindly tell us why they are thus bracketed?

Pale *semidecandriella* are not liable to be confounded with *marmorea*, if care be taken. The best point of distinction seems to be, that in *marmorea* the dark shade which takes up the costal part of the anterior wings is continuous to the thorax, while in *semidecandriella* it does not extend beyond the dark oblique line, the basal part being unicolorous grey.

The order in which our British species of this group are arranged does not seem altogether satisfactory. The new species *blandulella* is closely allied to *maculea* and *hubneri*, and *leucomellanella* seems rather out of place; but it seems difficult to determine with which species its affinities are greatest. I have adopted the following as being an apparently more natural arrangement in the species of this group:—*costella*, *fraternella*, *vicinella* (?), *leucomellanella*, *tricolorella*, *junctella*, *blandulella*, *maculea*, *hubneri*, *knaggsiella*, *maculiferella*, *semidecandriella*, *marmorea*. Of course it is open to objection, but less so it seems to me than the present arrangement.

Rayleigh Villa, Westcombe Park, September 19th, 1887.

LYCÆNIDÆ IN NORTH KENT.

By RICHARD SOUTH, F.E.S.

REFERRING to my contention that *Lycæna icarus*, *L. bellargus*, and *L. corydon* are not pure species, Mr. Tutt (*ante*, p. 257) says, "I believe the differences between any two of these three species

to be quite equal to that between the more closely allied European Argynnidæ and Melitææ." In this I most decidedly agree with Mr. Tutt, but then I regard some of the groups in the genera *Melitæa* and *Argynnis* in exactly the same light as I do the particular group of Lycænæ considered in my recent notes.

Further on Mr. Tutt asks, Why should we not call the common ancestor of *Lycæna icarus*, *Polyommatus phlæas* and *Thecla rubi* a species, and treat all and each of its descendants as varieties or aberrations? Well, perhaps we should not be very wide of the mark if we did so; but apart from the fact that the ancestral species is an unknown quantity, the interests of science demand that all the descendants shall be parcelled out and docketed as aberration of such and such a species,—species of this genus and genus of that family.

I cannot agree with Mr. Tutt that if an insect is not a pure species it must necessarily be considered an aberration. As regards classification, I contend that my use of the term "pure" in a comparative sense in no way affects the status of the insects under consideration. As species are usually determined I am open to admit that *icarus*, *bellargus* and *corydon* are more distinct from each other than are the members of certain groups of species in the *Tineina*. The difference of opinion between Mr. Tutt and myself lies principally in the value we attach to the term "species" as applied to the three insects in question. If Mr. Tutt considers these insects as pure species in the sense I have indicated (*ante*, p. 121), then he is certainly only consistent in calling the issue of a cross hybrids. I can, however, only suppose the insects to be as I have previously stated, not pure species, or, in other words, species which are but a step as it were above the stage known as a race. In fact, I cannot see any clear line of demarcation between such species as these and the domestic breeds of pigeons, sheep, and dogs. Some of the breeds of pigeons, for instance, have kept true for centuries, and compared one with the other are manifestly more distinct than is *icarus* from *bellargus*. We, however, know something definite of the common origin of the domestic races of birds and mammals, and so we term them "breeds"; but in the case of the butterflies under consideration, although we may reasonably suppose that they have all three descended from a common stock, yet we have no actual knowledge of this, and we therefore dub them "species."

In domestication, breeds may be said to be produced under artificial conditions, but at the same time in accordance with natural laws. Man employs, sometimes unwittingly, the very means adopted by Nature herself. That is, he selects the varieties best suited to his purpose to breed from, and when he has once got what he requires he is careful to keep the breed free from contamination, or, in other words, from crossing with any other variety. There is, perhaps, little to incite the several breeds to compete one with the other, as they are not dependent upon their own resources in procuring food, &c. Neither is there much inducement to rivalry on the part of the males or selection on that of the females, as their matrimonial affairs are usually arranged for them. If the several breeds of pigeons, sheep, and dogs had been produced under nature, the process of development would have been carried on at a very much slower rate than has been the case under domestication. A large number of the varieties would have been eliminated, or perhaps would not have been produced at all. Furthermore, in nature certain influences would have been at work, checking that free intercrossing which obtains so largely among the domestic breeds when not regulated by the breeder.

Returning to *icarus*, *bellargus* and *corydon*, and considering them as three races or tribes, I am inclined to think that the greatest bar to the free intercrossing of these insects in places where each is numerous is represented, is the inherited predilection females of each tribe have for the males of their own tribe (*ante*, p. 124). Although these three insects possess certain external characters by which they may be specifically separated for the purposes of classification, I cannot suppose that there are important differences in their reproductive systems. If then a female of either tribe should by chance forsake the traditions of her sex in that tribe, and mate with a male of either of the other tribes, such crossing would, according to my view, result in mongrel offspring; that is the issue of what under domestication are termed breeds, but which in nature rank as species, though not pure species, as I have endeavoured to show.

Mr. Tutt has seriously misunderstood the tenor of my argument if he apprehends that I consider *icarus* to be the primitive form of the group of *Lycænæ* treated in my notes. I *certainly* have supposed *icarus* to be the dominant form of the

group, but relative to the ancestral form I wrote (*ante* p. 124), "I should suppose that both sexes of the original stock, from which several species of *Lycæna*, including those with which we are chiefly concerned, have descended, were dark brown or blackish on the upper surface," &c.

Of the species of *Lycæna* most intimately connected by community of descent I should instance *eumedon* or *astrarche* v. *artaxerxes* as examples retaining more or less of the original character of a common progenitor, but neither of these species directly belong to the particular group I have had under consideration.

I still maintain the blue-black form among Mr. Sabine's varieties to be an instance of reversion. If the "pale varieties" were "decided cases of atavism," as Mr. Tutt would seem to regard them, and if these varieties are as numerous as suggested, then atavism must obtain among *L. bellargus* to a very considerable extent in some parts of Kent. I cannot, however, give in my adherence to reversion on a large scale any more than to "wholesale hybridisation," as I do not consider there is any reason to suppose either one or the other probable. If the varieties in question are mongrels, as I believe them to be, the result of an occasional intercrossing would suffice to keep up the supply of these varieties. The offspring of a crossing between *carus* and *bellargus* would, according to my views, be fertile, and, whether pairing among themselves or with *icarus* or *bellargus*, the mongrel character would be reproduced, to a greater extent, perhaps, when the parents were both mongrels, and in a lesser degree when the pairing was between mongrel and *bellargus* or *icarus*.

October 7th, 1887.

A REPLY TO MR. BRIGGS.

By RICHARD SOUTH, F.E.S.

THE critique by Mr. Charles A. Briggs (*ante* p. 353), on what he facetiously styles the "Mongrel-Hybrid Theory," is rendered nugatory by the writer's inordinate indulgence in unseemly banter.

Perhaps Mr. Briggs will hardly be surprised when I say that I think his comments on the opening remarks of my note (*ante*,

p. 1) from which he misquotes (*ante*, p. 254) are most ungenerous. I have nowhere stated that I had cognisance of, or that I even expected to be conversant with, the entire scheme of variation obtaining among such insects as *Lycæna icarus*, *L. bellargus* and *L. corydon*. Throughout my notes I especially referred to and dealt with the more constant varietal phases, and this fact must be patent to all who may have perused my observations in an impartial spirit.

Here is the entire passage from which Mr. Briggs has misquoted:—"My object, however, was not so much the acquisition of extraordinary forms as a desire to obtain a knowledge, as far as this was practicable, of the whole range in the variation of these species in particular South of England localities." If my ambition had been solely the acquisition of extreme forms, I probably could have obtained such examples through the same channels as do those collectors who spend years, and not a little cash, in amassing row after row of curious forms. I preferred, however, to examine numbers of the specimens in their native haunts, and select those which suited my purpose. In this way I maintain that I did ascertain, as far as it was possible for me to do, the whole range of variation in *Lycæna corydon* at Ventnor and Eastbourne.

I must also point out that by the substitution of the word "some" for "many" Mr. Briggs is misleading. Both words certainly express an indeterminate number, but "many" has greater numerical value than "some." I wrote (*ante* p. 1), "I have myself given *many* hours to the examination," &c.

I have perhaps given to this part of Mr. Briggs' paper more consideration than it really deserves, but I think I detect therein the true purpose of his contribution to the discussion on Mr. Sabine's varieties, &c.

As regards a common ancestry for *Polyommatus phleas*, *Lycæna icarus*, and *Thecla rubi*, I am afraid that I cannot add much that would tend to render the suggestion less objectionable to Mr. Briggs. I do not know whether Mr. Briggs is a disciple of the special creation theory, but from his remarks (*ante*, p. 254) I cannot suppose that he favours evolution. Therefore, as I am distinctly an evolutionist, it is possible that we regard the matter in dispute from antagonistic standpoints. My return to the ancient biological creed is not probable, but if Mr. Briggs

has not yet seen reason in the theory of evolution, I hope his acceptance of the newer doctrine may not be "out of the range of practical politics."

Any one who will take the trouble to examine any large collection of *Lycænidæ* to which he may have access, and will also study the habits of the larvæ and the appearance and structure of ova, larvæ and pupæ of the genera *Polyommatus*, *Lycæna* and *Thecla*, should not, from an evolutionist's point of view, have any difficulty in admitting the probability of these being modified descendants of a common ancestor.

Mr. Briggs would seem to expect that I may be inclined to go further than simply suggesting community of descent for the trio adverted to. In this he only does me justice. I have but to contemplate the wonderful and beautifully wrought chain which links species with species, genus with genus, and family with family, to say that I am prepared to make a very much more sweeping assertion. Neither the present time nor place are, however, suitable for any such extended statement of my convictions touching the question of origin by descent.

Concerning *Lycæna argiades* I think that if Mr. Briggs will be good enough to again read my observations upon the occurrence of this insect in England, he will find that I have not put forward any dogmatical opinion. I admitted at the time that my view was necessarily speculative, and my mind is not now closed on the subject. If it can be shown that my conclusions were arrived at by a false process of reasoning, well and good; but I contend that the "ready-made theory," as Mr. Briggs somewhat unkindly terms my view of the matter, is not upset by a simple statement of dissent, even though it be accompanied by a suggestion that *L. argiades* cannot have been in this country for even so short a period as thirty years previous to the time of its capture. That the species does not appear to have been detected in any part of this country before the year 1874 (Entom. xviii. 292) is no proof that it did not exist here anterior to that date. I have admitted as possible both immigration and introduction by man's agency; but although I will not argue the point further here, I may say that I still incline to the opinion expressed (Entom. xix. 6). It may, however, interest Mr. Briggs to know that I am engaged on a work in which this and other matters of a kindred nature will be more

comprehensively dealt with than is possible in the pages of a magazine.

I have not directly replied to his other questions and objections; but Mr. Briggs will, I trust, pardon any seeming discourtesy. The fact is, he has dealt too much in sarcasm and too little in argument. It is really cruel of Mr. Briggs to expect one to divest his observations of the ridicule in which they are so closely enveloped, to ascertain the exact bearing of his queries or the amount and quality of the evidence he has to offer in support of his contentions.

October, 7th, 1887.

[With the following note this discussion is now closed.]

NOTE ON THE GENUS *LYCÆNA*.

By J. JENNER WEIR, F.L.S., &c.

I HAVE taken no part in the heated controversy over this genus. The dispute appears to me to be one of words only. My own views may be thus briefly sketched:—No two insects are probably exactly alike. When a specimen exhibits a difference from the normal type, such as may perhaps never occur again or but rarely, this I take to be an aberration. Then there are varieties constantly recurring,—often local varieties which may be termed races; such varieties insensibly pass into subspecies, and these again into species. Some species may be closely allied, such as *L. icarus*, *L. bellargus*, and *L. corydon*; others less closely allied to these, as *L. ægon* or *L. astrarche*; others still more remotely allied, as *L. semiargus*, *L. minima*, and *L. argiolus*. *Bæticus*, often placed in the genus *Lycæna*, is the type of Latreille's genus *Polyommatus*, and is even more remotely allied to the species mentioned above.

I trust none will deem me dogmatic when I state that in my opinion, when three kinds of insects are found constantly existing in each other's company, without crossing as a rule, they are essentially species; between these there is apparently a "physiological" bar as Dr. Romanes has termed it, or *amixia* as it has been termed by Professor Meldola in his translation of Dr. Weismann's 'Studies in the Theory of Descent.'

I cannot expect that all the readers of the 'Entomologist'

will hold the same views as my own; but I do most earnestly hope that so long as I am in any way connected with it, all future dissertations which may appear in its pages will be carried on with courtesy, in that calm spirit which should distinguish all scientific discussions, and that all observations of a personal character may be avoided.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

PARNASSIUS DELIUS IN WALES.—Your readers will be interested in hearing that a specimen of *Parnassius delius*, Esp. has been brought to me, captured by Mr. E. W. Schwartz, a pupil at the college, early in September last, near Bangor, North Wales. It was discovered settling on flowers, on a warm afternoon, and appeared somewhat sluggish in its movements. The specimen is much damaged, but of the species there can be no doubt. It seems to occur only in strictly Alpine localities, and can hardly therefore in any sense be regarded as British. Doubtless the specimen is an escape from the stock of some collector. But it would be interesting to know if its occurrence can be satisfactorily explained, and whether there is any other record of its appearance in Britain.—T. N. HART SMITH; Marlborough College, October 14.

DIURNI IN ARGYLESHIRE.—During a short sojourn in the above-named county, in the month of July of the present year, I observed that the specimens of *Vanessa urticae*, which were fairly common and in very fresh condition, were larger and more gorgeously coloured than those ordinarily seen in the neighbourhood of London. More than one variety also came under my notice, as two or three other entomologists were also staying in the district, and I remarked that some specimens on their setting-boards had more black on the lower wings than is usual with the ordinary type; and that in one case in particular the absence of black on the contrary, and the fiery character of the red were very conspicuous. I may add that Newman states, on p. 54 of his 'British Butterflies and Moths,' "Scottish examples are larger than English ones." Several specimens of *Epinephele ianira*, moreover, were of a particularly black type; while those of *Lycæna icarus* were (as well as being larger in size than the

English type), in the case of the female, of a much more burnished or metallic appearance than the usual form. *Pieris napi* proved abundant on the peat-moss, and its green veining was singularly strongly marked. Other butterflies seen were as follows:—*P. brassicæ*, *Epinephele hyperanthes*, *Cænonympha pamphilus*, *Satyrus semele*, *Pararge ægeria*, *Polyommatus phlæas*. A specimen of *Vanessa polychloros*, in fine condition, was captured by Mr. John Mackay, of Glasgow, on July 20th, in South Knapdale, Argyleshire, on our return from the celebrated Kilmorie kirkyard, in the direction of Castle Sweyn, and at the distance of a mile or somewhat less from the former place. I take the opportunity of mentioning this capture, as on p. 57 of Newman's 'British Butterflies and Moths' the following statement occurs:—"This butterfly seems to be absent from Scotland and Ireland. In England its rarity in the north and extreme south-west is very noticeable: from Northumberland and Westmoreland I have no record of its occurrence; from Cumberland, Durham, and Lancashire, one specimen from each county; six Yorkshire localities are reported."—F. A. WALKER, D.D.; Dun Mallard, Cricklewood, N.W., August 8, 1887.

VANESSA C-ALBUM IN SUSSEX.—A specimen of this insect was taken in my garden here, towards the end of last September. I had never seen this insect in Sussex before.—DOVER A. EDGELL; Firle, Lewis, October 12, 1887.

HERMAPHRODITE LYCÆNA ICARUS.—I took a specimen of *L. icarus* with the male and female markings clearly represented on the opposite wings.—DOVER A. EDGELL; Firle, Lewis.

LYCÆNA BÆTICA IN FRANCE.—I took a perfectly fresh specimen of this insect on Sept. 7th inst., in a garden at Etretat, on the Normandy coast. Though I did not leave Etretat till more than a week later this was the only specimen I saw.—A. M. REID; Beckenham, Kent.

ACHERONTIA ATROPOS IN HAMPSHIRE.—On September 12th I had a fine female *Acherontia atropos* brought to me in perfect condition, which was said to have been found crawling over a bee-hive. It measured as nearly as possible five inches in expanse.—J. M. ADYE; Somerford Grange, Christchurch.

FOOD OF GNOPHRIA RUBRICOLLIS.—Will any one kindly inform me of a common food-plant for *G. rubricollis*? A good many

entomologists dispute its feeding on lichens at all. I gave the larvæ lettuce, which was eaten at first, but afterwards they would not touch it. I should also like to know if larvæ can be prevented from hybernating by being kept warm.—WALTER DANNATT; Ivy Dene, Westcombe Park, Blackheath, S.E., October, 1887.

SPHINX CONVULVULI.—In addition to the records of last month (Entom. 272), we have received the following:—

Scotland.—Two *Sphinx convolvuli* were found as far north as Cromarty, in the beginning of September; one was brought to me much damaged, which had been caught in a house; the other was captured on the sea-shore and brought to me alive and in good condition.—H. FRERE; 27, Newmark Hill, Wimbledon.

Yorkshire.—I had brought to me four *S. convolvuli* between the 28th of August and the 3rd of September. I then thought it time to look for them, and on the 5th of this month I netted three fine imagos, and one each on the following three evenings, all in good condition. Since then the evenings have been cold and stormy, and I have not seen any since the 8th, but intend to have another look if the evenings become warmer. I took one more on September 30th.—GEORGE ROSE; Barnsley. Two have been taken in the outskirts of Beverley, and two by lamp-lighters in the streets of Hull.—N. F. DOBREE; Beverley, E. Yorks, October 24, 1887.

Staffordshire.—*Sphinx convolvuli* has occurred this autumn in North Staffordshire. A specimen was brought to me in good condition, which had been found on a rail at Madeley railway-station, about 300 yards from this house. It is in good condition. This is the third specimen that, to my knowledge, has been taken in this parish. One in 1875; one last year; and the third, as I have just said, this year.—THOS. W. DALTRY; Madeley Vicarage, Newcastle, Staffs., Oct. 18, 1887.

Lincolnshire.—Three specimens of *S. convolvuli* have been taken in this town within this last month, and one specimen of *Acherontia atropos* was taken on the Royal Dock.—C. R. LOW; Kent Street, Grimsby, Sept. 24, 1887.

Suffolk.—I have obtained three *Sphinx convolvuli* this year; one I saw a man pick up out of the river; another a friend found on the pavement; and another my uncle's groom brought to me.—A. C. FREEMAN; 38, Foundation Street, Ipswich.

Essex.—It has been my good fortune this year to capture

fifty specimens of *Sphinx convolvuli* in my garden here, chiefly over *Nicotina affinis* which I had planted in large numbers to attract them, but some over petunia and pink geranium. Last year, at my old residence in Walthamstow, I captured nine specimens; the year before, seven; and in 1875 seven specimens, but none during the intervening period; so that after an interval of ten years, during which I failed to meet with a single specimen, I have taken this beautiful insect freely for three consecutive years. It was especially abundant this year, when it was not uncommon for a pair to be flying over the flowers at the same time.—SIDNEY COOPER; Hawkwood, Chingford, Oct. 10.

Sussex.—Three specimens of this moth were taken in this village during the first week of September, but all were worn and faded, as if they had been flying some time, thus confirming the view of your Windsor correspondent, that they have emerged earlier than usual.—E. BAYLEY; Keymer.

Hampshire.—In my notice in last month (Entom. 274, line 10) the words should be "and took three," &c., not "saw."—WALDEGRAVE; Bookham Lodge, Cobham, Surrey, Oct. 20, 1887.

Dorsetshire.—A female *Sphinx convolvuli* was brought to me early in September, crushed into a small flower-pot and nearly dead; three others have also been taken in this neighbourhood. O. P. CAMBRIDGE; Bloxworth, Oct. 5, 1885.

Middlesex.—I took *Sphinx convolvuli* in Acton hovering over a tobacco plant, to which it came and flew away several times in one evening in August.—WILLIAM WOODHAMS; 18, Shaa Road, Acton, W. A *Sphinx convolvuli* was brought to me by a young friend on September the 7th. With the exception of a very tattered specimen I found near Isleworth in 1878, this is the first I have seen in this neighbourhood. I had not met with this insect since I took three and saw others on the wing at Starcross, over pentstemon bloom, one moonlight night early in October, 1857; the next evening our cat caught one. Another was captured at light; this one was left under a finger-glass all night and laid a number of eggs: these hatched out shortly afterwards, but the larvæ died through a misadventure.—WILLIAM POWLEY; Hounslow, October 14, 1887.

ABUNDANCE OF SPHINX CONVULVULI IN FRANCE.—Referring to my note about *Sphinx convolvuli* in France (Entom. 230), I have recorded the capture of twenty-five only, but before

leaving Etretat my brother made the total to over forty; after that he refrained from catching more, though they came in swarms every evening to the same bed of petunias. I also took *Macroglossa stellatarum* this year, much more frequently than on any previous visit.—NIEL H. REID; Beckenham, Kent.

BOMBYX RUBI.—Will any one who has reared the larvæ of these insects successfully through the winter give me a few hints? I have tried several times, with very fine larvæ, but have never had a single imago. I have kept them in a wooden cage with a perforated zinc top, three or four inches of earth at the bottom, lightly covered with moss. Some winters this has stood in a room without a fire, others in an arbour sheltered from rain but exposed to cold and damp; the results have always been equally unsatisfactory. I have now about twenty larvæ, and should like to try and rear them. Should the moss be thicker, or damped occasionally? Once a few began to creep about in March, but did not touch the half-dead bramble leaves which were all I could find to give them. They are always shrivelled up to nothing, huddled together as if for warmth.—E. BAXLEY; Keymer, Sussex.

FOOD OF LOBOPHORA VIRETATA.—Mr. Bath has shown me the correspondence which has taken place in the 'Entomologist' in reference to the food-plant of *Lobophora viretata*. Several young larvæ of this insect were taken by myself, at Sutton Park, in the year 1883; they were feeding upon the young leaves or shoots of the holly (*Ilex aquifolium*), upon which I continued to feed them in confinement. I was successful in rearing about a dozen perfect insects. My brother, who used to collect insects, was with me at the time of taking the larvæ, and can vouch for the above.—ARTHUR PIMM; 107, Broad Street, Birmingham.

NOCTUA DEPUNCTA IN WILTSHIRE.—On the 23rd of July I took a good specimen of this rare insect at sugar in an open space of a wood near Marlborough. Not being quite sure of the insect's identity, I waited till I could ask the opinion of a more learned entomologist; hence the delay in making the communication.—M. KIMBER; Cope Hall, near Newbury.

ACRONYCTA ALNI FEEDING ON SALLOW.—I found a full-fed larva of *Acronycta alni* on willow here, which pupated in a bramble-stem.—C A. SLADEN; Burghclere, Newbury, Oct., 1887.

MALFORMATION OF LEPIDOPTERA.—From larvæ of *Cidaria testata* found on heather, but which preferred sallow in confinement, most of the specimens which emerged wanted one or other hind wing, and one specimen both hind wings; otherwise they were perfectly developed, and fine and well-marked specimens. What was the cause of this? It certainly was not lack of food, or handling the pupæ.—C. H. SLADEN; Burghclere, Newbury, October 5, 1887.

CATOCALA FRAXINI IN HERTFORDSHIRE.—On Friday, Sept. 23rd, a specimen of *C. fraxini* was brought to me; it had been picked up on a path, under some ivy which had been trimmed in the course of the day. Unfortunately it has suffered from rough treatment.—R. W. BOWYER; Haileybury, Hertford, Sept. 25, 1887.

CATOCALA SPONSA IN KENT AND HANTS.—On September 1st, while sugaring in a wood near Blackheath, I took *C. sponsa*; it was on the sugar the same time as *C. nupta*. Although I sugared night after night, both before and after, I saw no more *sponsa*. I may mention I had just returned from the New Forest, where *C. sponsa* was swarming this year; *C. promissa* was common, but about one to ten *sponsa*. It was a sight to see *sponsa* flying high up round the oak trees long before the sun set. No sooner was the sugar on the trees, when there were at least four or five *sponsa* on each.—WILLIAM DANNATT; Ivy Dene, Westcombe Park, Blackheath, S.E., October, 1887.

CATEPHIA ALCHYMISTA.—It may be advisable to warn the readers of the 'Entomologist' that *Catephia alchymista* will probably be pretty abundant next year. A continental dealer has obtained the pupæ freely enough to offer at from 1s. 6d. to 3s. 6d. each to many of our British collectors. I should not have mentioned the fact, but I saw (Entom. 239) that one had been already captured on the south coast. Of course the capture may be genuine, but under the circumstances confirmation is certainly required. So far, I believe, there are only two British records—one specimen mentioned in Newman's 'British Moths,' the other captured by Mr. Davis, of Dover, and recorded Entom. xv. 162.—J. W. TUTT; Blackheath, September 20, 1887.

NOTES FROM THE FOREST.—I am glad to be able to say that the *Catocaladæ* have at last been again abundant. During the

first part of August Mr. McRae, of Bournemouth, and I sugared and took large numbers of *C. sponsa* and *C. promissa*, and on one night only, at Brockenhurst (Aug. 8th), we managed to complete 100 specimens between us, and could have taken many more had we chosen; the larger portion were *C. promissa*, *Amphipyra pyramidea*, and *Calymnia trapezina*, being perfect pests, with an occasional *Cerigo matura* or two.—J. M. ADYE; Somerford Grange, Christchurch, September 22, 1887.

LARVÆ OF AGROTIS RIPE—CANNIBALS.—I have lately been keeping a large number of these larvæ, and on two occasions have seen them engaged in eating one another, even though well supplied with their proper food at the time. I do not recollect having read it anywhere. — S. GRAVES; 29, Victoria Street, Tenby, September 16, 1887.

INO STATICES AT CHINGFORD.—I was glad to find this season the pretty little *Ino statices* plentiful in one of my fields, and to be able to obtain a fresh series in the finest condition.—SIDNEY COOPER; Hawkwood, Chingford, October 1, 1887.

STRENIA CLATHRATA.—With reference to the Rev. J. Seymour St. John's query on the above species (Entom. 232), I may say that *Strenia clathrata* is always successively brooded in one sheltered locality in Kent. Whatever the atmospheric conditions, I rarely visit Chattenden Woods, near Gravesend, from May to the middle of August, without finding specimens in almost all stages of good, bad, and indifferent condition. The late specimens of one year, I should presume, produce the late specimens of the following year, although I dare say many of the produce of the earlier broods produce imagines the same year, as the insect is certainly sometimes more abundant at the beginning of August than in the middle of July. This seems rarely to happen on the more exposed hills, where the insect is common until the first week in July, and is then rarely seen.—J. W. TUTT; Blackheath.

MICRO-LEPIDOPTERA IN DORSETSHIRE.—Micro-Lepidoptera have been unusually abundant here, while Macros seem to have been comparatively very scarce; nor have we in this district had the abundance of the white cabbage butterflies noted in many other places. Among our best captures may be mentioned *Tinea arcella*, *T. nigripunctella*, *Xysmatodoma argentimaculella*, *Gracilaria elongella*, *Gelechia gemmella*, *Cleodora cytisella*, *Ela-*

ista serricornis, and *Pterophorus paludum*.—O. P. CAMBRIDGE; Bloxworth, October 5, 1887.

SIREX JUVENCUS AT OLDHAM.—For the information of Mr. F. Gunther (Entom. 233), I may say that I have in my collection a pair of the above species, captured last July by my son, in one of our modern cotton mills.—J. T. RODGERS; Oldham, Sept. 1888.

THE ABUNDANCE OF ICHNEUMONIDÆ IN 1887.—I can fully corroborate Mr. E. R. Bankes' experience (Entom. 285) as to the immense quantity of ichneumons which have appeared in our breeding-cages this summer instead of moths, as far as my observations are concerned; but the last sentence, referring specially to the phenomenal appearance of the Pieridæ this season, does not seem like being borne out here. Mr. Bankes says, "It is surely not to be expected that our native stock of ichneumons would be able to cope with the hosts of larvæ resulting from such an exceptional visitation." From this I suppose Mr. Bankes to mean that our normal numbers of Ichneumonidæ would not at once be able to cope with the progeny of the probably immigrating parents; but how soon Ichneumonidæ adapt themselves to a changed order of things the following will show:—For the sake of amusement, I have tried to find out what probability there is of a numerous brood of *P. brassicæ* next spring. I collected about 200 larvæ of this species from a fence opposite Westcombe Park railway-station, taking only those that left the food-plant for the purpose of pupation, carefully looked after them, and as a result I have only three perfectly-formed pupæ and two crippled in the change, all the rest having produced the characteristic and well-known yellow *Microgaster* cocoons. Three out of quite 200 do not point to any special abundance next year, and if we come to consider the millions of extra Ichneumonidæ developed, owing to the extreme abundance of their hosts this autumn, the progeny of our early imagines will not have much chance, and look like having a very lively time of it if they are to survive at all. In the 'Substitute,' 1856—57 p. 41, I notice there is a communication very similar to the above by Mr. C. G. Barrett. He says, "Last autumn (1855) the larvæ of *Pieris brassicæ* abounded in Shropshire to such an extent that the broccoli were almost destroyed, and the savoys and borecs completely reduced to skeletons, and even the turnips w

extensively attacked; it seemed as if the air would be filled with white butterflies this spring, but to my surprise they were nearly all ichneumonized; certainly not one-fifth, perhaps not one-tenth escaped, the walls, railings, and even trees, were studded with the little yellow or white bunches of *Ichneumon chrysalids*." I suppose by "they" Mr. Barrett meant the *autumnal* larvæ.—J. W. TUTT; Westcombe Park, S.E., October 6, 1887.

CALLIMORPHA HERA, &c. : CORRECTION.—An error has occurred (*Entom.* 274 and 281) which I should like to rectify. I did not stay at Tenby as stated, but at Saundersfoot, four miles from Tenby. I went from there on August 13th to South Devon, in search of *C. hera*, and did not take the Noctuxæ mentioned until after my return to Saundersfoot on August 20th.—J. JAGER; 180, Kensington Park Road, Notting Hill, W., October 18, 1887.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—October 5, 1887. Dr. Sharp, President, in the chair. Mr. Jacoby exhibited a specimen of *Aphthonoides beccarii*, Jac., a species of *Haltica* having a long spine on the posterior femora. He also exhibited a specimen of *Rhagiosoma madagascariensis*, and remarked that it had the appearance of a Longicorn. Mr. Stevens exhibited a very dark specimen of *Crambus perlellus* from the Hebrides, which its captor supposed to be a new species. Mr. Porritt remarked that this brown form of *Crambus perlellus* occurred at Hartlepool with the ordinary typical form of the species, and was there regarded as only a variety of it. Mr. Slater exhibited a specimen of *Gonepteryx cleopatra*, which was stated to have been taken in the north of Scotland. Mr. Jenner Weir remarked that although the genus *Rhamnus*—to which the food-plant of the species belonged—was not a native of Scotland, some species had been introduced, and were cultivated in gardens. Mr. South exhibited an interesting series of about 150 specimens of *Boarmia repandata*, bred in 1876, and during the present year, from larvæ collected on bilberry in the neighbourhood of Lynmouth, North Devon. The series included strongly marked examples of the typical form, extreme forms of the var. *conversaria*, Hüb., a form intermediate between the type and the variety last named,

and examples of the var. *destrigaria*, Haw. Mr. South said that an examination of the entire series would show that the extreme forms were connected with the type by intermediate forms and their aberrations. Mr. Poulton exhibited young larvæ of *Apatura iris*, from the New Forest; also eight young larvæ of *Sphinx convolvuli* reared from ova laid on the 29th August last by a specimen captured by Mr. Pode in South Devon. Mr. Poulton said the life-history of the species was of extreme interest, throwing much light upon that of *Sphinx ligustri*, as well as upon difficult points in the ontogeny of the species of the allied genera *Acherontia* and *Smerinthus*. Mr. Stainton commented on the interesting nature of the exhibition, and said he was not aware that the larvæ of *Sphinx convolvuli* had ever before been seen in this country in their early stages. Mr. M'Lachlan remarked that females of this species captured on former occasions, when the insect had been unusually abundant, had been found upon dissection to have the ovaries aborted. Mr. R. W. Lloyd exhibited two specimens of *Elater pomonæ*, and one of *Mesosa nubila*, recently taken in the New Forest. Mr. Dannatt exhibited a specimen of the so-called "vegetable caterpillar" from New Zealand. Mr. Porritt exhibited a series of melanic varieties of *Diurnea fagella*, from Huddersfield, and stated that the typical pale form of the species had almost disappeared from that neighbourhood. Mr. Goss exhibited, for Mr. J. Brown, of Cambridge, a number of puparia of *Cecidomyia destructor* (Hessian Fly), received by the latter from various places in Cambridgeshire, Norfolk, Suffolk, and Wiltshire. He also exhibited a living larva of *Cephus pygmæus*, Lat. (the Corn Sawfly), which had been sent to Mr. Brown from Swaffham Prior, Cambridgeshire, where, as well as in Burwell Fen, it was stated to have been doing considerable damage to wheat crops. Mr. Verrall, in reply to a question by Mr. Enock, said he believed that the Hessian Fly was not a recent introduction in Great Britain, but had been here probably for a great number of years. In reply to a further question, he admitted that he was unable to refer to any but recent records of its capture. Prof. Riley said he was unable to agree with Mr. Verrall, and was of opinion that the Hessian Fly had been recently introduced into this country. Its presence here had not been recorded by Sir Joseph Banks, by Curtis (who paid great attention to farm

insects), by Prof. Westwood, by the late Mr. Kirby, or by any other entomologist in this country who had given especial attention to economic Entomology. Prof. Riley also said it seemed highly improbable, if this insect had been here so many years, that its presence should have so long remained undetected both by entomologists and agriculturists. It had been stated that the insect was introduced into America by the Hessian troops in 1777, but this was impossible, as its existence at that date was unknown in Hesse. Mr. M'Lachlan, Capt. Elwes, Mr. Verrall, Mr. Jacoby, and Dr. Sharp continued the discussion. Mr. James Edwards communicated the second and concluding part of his "Synopsis of British *Homoptera-Cicadina*." Prof. Westwood contributed "Notes on the Life-history of various species of the Neuropterous genus *Ascalaphus*." Capt. Elwes read a paper "On the Butterflies of the Pyrenees," and exhibited a large number of species which he had recently collected there. Mr. M'Lachlan said he spent some weeks in the Pyrenees in 1886, and was able to confirm Capt. Elwes' statements as to the abundance of butterflies in that part of the world. He remarked on the occurrence of Spanish forms in the district, and on the absence, as a rule, of the peat-bogs so common in the Swiss Alps. The discussion was continued by Mr. Distant, Mr. White, Dr. Sharp, and others.—H. Goss, *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—Sept. 22nd, 1887. R. Adkin, F.E.S., President, in the chair. Mr. Jager exhibited *Stilbia anomala*, from Tenby; *Callimorpha hera* and var. *lutescens*, from Devon; and stated he had obtained ova of *hera* and now had the larvæ feeding. Mr. Sheldon, *Xanthia fulvago* and var. *flavescens*, and remarked on the number of melanic specimens which he had observed in a particular valley in Derbyshire. Mr. Cooper, dark forms of *Eugonia queranaria*, upon which some interesting comments were made by Mr. Goldthwaite. Mr. Carpenter, a number of specimens of *Argynnis paphia* var. *valesina*. Mr. Tutt, *Melanthia bicolorata* var. *plumbata*, from Rannoch. Mr. Oldham, *Dicycla oo*, from Epping Forest; a dark form of *Arctia caia*; and a variety of *Pararge megæra*. It appeared from the remarks of members that *D. oo* had occurred freely at Epping and in some parts of Kent. Mr. Skinner exhibited a specimen of *Deiopeia pulchella*, taken at Dover, 1886; a bleached specimen of *Epinephela ianira*.

and very pale forms of *Zygæna filipendulæ*. Mr. Adkin, bred *Melanippe rivata*, *M. galiata*, and *Anticlea cucullata*. Mr. Goldthwaite, varieties of the underside of *Lycæna bellargus*. Mr. Elisha, *Gelechia hippophaella*, from Deal; *G. vilella*, *Incurvaria capitella*, *Agrotis ashworthii*, &c. Mr. J. Jenner Weir, *Carpocapsa saltitans*, and living specimens of the larva of *Myrmeleo europæus*, and made some interesting observations relative to his exhibits. Mr. West, of Greenwich, showed eight species of *Haliphus*, taken by him out of one pond. Mr. Billups, on behalf of Mr. Tugwell, exhibited *Limneria ensator* and *Macrocentrus linearis* var. *pallidipes*, both bred from *Cucullia gnaphalii*; and on behalf of Mr. Turner, two old wedges which had been used to fasten the chairs holding the rails to the sleepers on the London, Brighton and South Coast Railway, between New Cross and Forest Hill, containing nests of *Osmia rufa*, and read notes.

October 13th.—The President in the chair. Dr. Rendall exhibited *Xanthia fulvago* var. *flavescens*, &c. Mr. Jager, varieties of *Luperina testacea*, from Tenby. Mr. Tugwell, a specimen of *Sphinx convolvuli*, taken at Greenwich; a fine streaked variety and other nice forms of *Spilosoma menthastris*. Mr. Wellman, bred examples of *Acidalia immutata*. Mr. Levett, two varieties of *Smerinthus tilia*. Mr. Oldham, Lepidoptera from India. Mr. Fremlin, specimens of *Vanessa urticae*, showing absence of colour, and contributed notes. Mr. Jenner, of Lewes, two specimens of *Acidalia immorata*, a species new to Britain, which he stated were taken near Lewes by Mr. H. C. Morris. Mr. South, *Melanippe sociata*, *M. montanata*, from the Hebrides; an apparently apterous specimen of *Zygæna filipendulæ*, bred by him at Folkestone, 1885; a specimen of *Z. lonicerae*, appearing to have four antennæ. After some discussion, Mr. Tugwell expressed an opinion that the second pair were merely the pupal covering of the antennæ proper, as the insect did not seem to have altogether escaped from the pupa-case, part of it still adhering to the head. Mr. South also showed four varieties of *Argynnis selene*, and one of *A. euphrosyne*; and read notes relative to his exhibit, and on the result of experiments made by him in reference to the pale spots appearing on certain of the Argynnidæ. Mr. West (Greenwich), *Hydaticus seminiger*, and stated it was twelve years since he last met with this species. Mr. Mauger, Hymenoptera from the Brazils.—H. W. BARKER, Hon Sec.

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AGROTIS FENNICA.

By N. F. DOBRÉE.

As the information in all such works as I have read, whether English or Continental, regarding this rare insect is very meagre, and the descriptions of it hardly any better, all apparently copied from one another, anything new regarding it will interest.

I have for years sought for it fruitlessly in Petersburg, Finland, and Stockholm, where it is not known to occur, so far as I could learn, and also in the many Continental price-lists that are sent me annually. I have also written for it to dealers in Montreal and Quebec without success, and I failed to find it in the entomological collection sent over for the late Colonial Exhibition in London by the Montreal Society.

My friend the late Mr. George Norman, who, in 1874 and 1875, spent two seasons entomologising in Canada on the borders of the lakes near Niagara, found it there of excessive rarity. He got but a single one himself at rest on palings in the month of August, and, though the object of his particular research, he could only acquire two more from resident collectors he met. All these specimens are males, and agree well with the drawings in Newman and Herrich-Schäffer.

I have now quite lately received it from Western Siberia, and seem at last to have traced it to its home. My correspondent, who, I may say in parenthesis, is the curator of a German museum and an experienced entomologist, after a five years' sojourn in the neighbourhood of Wladiwostock on the Amoor River, chiefly made for entomological purposes, writes me:—

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"I am not surprised that you are so much struck with the difference between the male and female, but I can fully answer you on that point. The specimens with the broad yellow-ochreish shading in the inner margin of the upper wing are males; the females never have it, at least not in Siberia. I have bred it myself in Kamchatka in the summer, and was also at first surprised to get two such different imagoes from the same larva. In 1884 I found some 500 of the larvae around Nivalajefsk, but unfortunately all but two were immatures. The larvae feed in preference on *Erythronium* and *Corydalis japonica*, and remain by day hidden in the earth. I have two of these larvae preserved, of which I have to send you one. It is an insect which occurs generally here and there throughout Amurland, and I was fairly surprised in my captures of it."

A point of great interest in this communication is the establishment of a great difference between the male and female. The figures in Newman and Herrick-Schäfer are all of the former; but the latter, the female, seems to have been unknown to any of them. The following is a description of both sexes from the specimens I possess:—

Male.—Fore wings warm bistre-brown, with faintly darker transverse lines, the ground colour shading off on the inner margin to a broad band of light ochre; stigmata dirty white. Hind wings and body a very pale shade of the fore wings.

Female.—Fore wings quite uniform dark ashy grey, with faintly darker transverse lines, similar to the male; stigmata dirty white. Hind wings and body very light shade of the upper wings.

It will thus be readily seen that the two sexes might easily be mistaken for quite different species!

I may further add to the general description that in both sexes the wings are remarkably narrow, and the stigmata exceptionally wide apart; in fact Guenée is quite correct in his remark that the insect has a look quite *sui generis*.

Mr. G. Norman's Canadian specimens, which are all males, quite agree with mine of that sex from Amurland in size and colouring.

Beverly, N. York, November, 1887.

ON A JAPANESE SPECIES OF *SANDALUS*.

BY GEORGE LEWIS, F.L.S.

*SANDALUS SEGNIS* (male and female).

THE genus *Sandalus* was formed by Knoch in the first year of this century to receive two insects from North America, and the present species, which is the first from Asia, is somewhat similar to them. The known species of *Sandalus* number, according to the Munich Catalogue, to about twelve; they are rare in collections, and certainly local or uncommon in nature, and I believe the imagos are very short-lived. I found the first specimens in Japan, on the 10th June, clinging to some old railings which were partly rotten and lichen-covered, and from the condition of the specimens it was evident that they had just left their pupa-skins. In the daytime the beetles are very sluggish and inert, and I think it possible that they never move, unless they are disturbed, until the evening when they fly to meet their mates. The disparity in the size of the sexes classes *Sandalus* with those insects in which the female is often several times larger than the male.

The figures given of a small male and an ordinary-sized female will be useful in giving an idea of the general outline of the genus (even if it does not serve to identify the species), which is a peculiar one, and may not be familiar to entomologists whose studies range over several classes of insects. The structure of the second and third pairs of legs and the claws at the end of all the tarsi will call to mind those of *Melolontha*, and they are doubtless used for clinging and moving in the same way; but in *Sandalus* the fore tibiae are simple and not armed, as in the other. The Lamellicornes use their strong fore tibiae for delving and excavating, while *Sandalus* belongs to the Rhipidoceridae, a family whose members during the stage of growth feed on

timber, and the laborious work of their lives is, as in the *Longicornes*, performed with their mandibles. There are no sexual differences in the legs or feet of *Sandalus* of much importance, except that the males have slightly dilated tarsi.

From the rarity of the individuals and the fewness of the species known, my speculation is that the great size of the female is owing to the magnitude of her eggs rather than to the quantity she bears, for if the current ideas on the differentiation and distribution of animals approximately correspond with reality, the greater the number of ova distributed by any female the greater the chance, the other conditions of life being equal, of the individuals becoming abundant and the species wide-spread.

SANDALUS SEGNIS.

Ovato-elongatus, crassus, griseo-pubescent; fronte utrinque tuberculato. Mas elytris brunneis; l. 11-18 mill. Fœm. elytris thoraceque concoloribus; l. 19-25 mill.

Male.—Head and thorax closely and slightly rugosely punctate, blackish, and densely clothed with a greyish brown pile; thorax with a medial line, hind angles emarginate and biangular before the scutellum. The forehead is conspicuously tuberculate at the insertion of the antennæ. The scutellum is obscurely black, and the elytra brown. The elytra have the suture a little raised, with three distinct dorsal striæ, and a fourth nearly obsolete, and visible only on the apical half of the wing-case; the interstices are punctured in longitudinal but slightly irregular rows, with the spaces between the punctures minutely rugose.

Female.—Sometimes twice the size of a male, and at others six times as large. The thorax is proportionately broader, and the angles, both at the sides and before the scutellum, are less acute. The elytra are concolorous with the head and thorax, and clothed throughout with a greyish pile; the punctures in the interstices are less deep and in less regular lines, and the spaces between the punctures are more rugose. The legs are the same colour as the under part of the body in both sexes.

Found at Nikko and Kashiwagi. Five examples.

PARASITES OF THE "HESSIAN FLY"

(Cecidomyia destructor, Say).

BY ELEANOR A. ORMEROD, F.E.S.

So much has been written during the past season relatively to the species of the parasites of *Cecidomyia destructor*, Say, which we have found present amongst us in this country, that it may be of interest to many of your readers to know that the opinion lately expressed by Prof. C. V. Riley (Entomologist of the United States) that these parasites would probably be found to be Russian, or of European origin, has been recently confirmed by Dr. Ch. Lindeman, Professor at the Academy of Agriculture, Moscow (whose works on Hessian fly and its parasites are too well known to require comment), who has recently named four species out of a collection of parasites which he had permitted me to forward him, as being Russian kinds.

In a letter lately received from him, Dr. Lindeman informs me that amongst the specimens of parasites which he finds amongst those reared from puparia of *C. destructor*, preserved from what were found on corn grown last year at Daleally, Errol, N.B., by Mr. D. Taylor, there are the following species:—

Semiotellus nigripes, Lind.

Tetrastichus rileyi, Lind.

Merisus intermedius, Lind., var. *micropterus*.

Platygaster minutus, Lind.

These are Russian species, which will be found described at length in Dr. Lindeman's paper, "Die Pteromalinen der Hessianfliege (*Cecidomyia destructor*, Say)"; and Dr. Lindeman has also had the great kindness to send to me a gift of a small collection of the four above-named species, and one variety of these parasites, which I am now having displayed for microscopic use with the utmost care.

Besides the above species, named by Dr. Lindeman from personal knowledge, he found in my consignment a single specimen, which he writes me agrees well with the description given by Prof. Riley of the American *Merisus destructor*, Say.

From the above observations it appears to me that we may look on a part of our visitation of *Cecidomyia destructor* having been derived from Russia; and with regard to what may be inferred from the presence of the species commonly known as

the American *Semiotellus* = *Merisus destructor*, I do not at all see that the presence of this militates against the whole of the attack being of European origin.

In the works of Kollar and Kaltenbach on injurious insects (to go no further) this parasite is mentioned under its synonym of *Ceraphron destructor*, Say, as a German parasite, and therefore it appears to me that the whole of our attack is extremely likely to be of European derivation.

For further information as to this special parasite (namely the *M. destructor*) in our present difficulties, with list of synonyms, the reader is referred to the paper on the "Parasites of the Hessian Fly," by Prof. Riley, published in the 'Proceedings of the United States National Museum, 1885'; and whilst I believe I am permitted by both the distinguished entomologists to whom I have alluded to mention the above results of investigation, at which in the case of Prof. Riley I have had the advantage of being present, I must also express my sincere thanks for such great aid in this most difficult investigation.

Torrington House, St. Albans, Nov. 11, 1887.

NOTES ON *SCOPARIA ANGUSTEA*.

By W. G. SHELDON.

THIS species has been until lately supposed to be a single-brooded one, appearing in August and September, and hibernating until the spring. Mr. C. G. Barrett, however (E. M. M. xxii. 42), says:—"Last May, at Plymouth, when searching on the old walls round the harbour, I found several larvæ of this species full-fed, and also pupæ. From these the moths emerged after a few days. It therefore seems that this species produces a spring brood on the south coast, when the winters are so mild as to allow the larvæ to feed through them, and this habit probably obtains to some extent throughout the South of England. I cannot, however, remember that I ever saw a spring specimen at Pembroke, where the moth was abundant in the late autumn." Mr. G. T. Porritt again (E. M. M. xxii. 209) says that he took the species commonly at Huddersfield at the end of July, and adds that he received young larvæ from

Mr. W. H. B. Fletcher, of Worthing, on the 11th of August, and that these produced imagines in October; he also states that Mr. Fletcher is satisfied it is only single-brooded at Worthing.

I now come to my own experience of the species. Early last February (on the 6th, I believe), I was looking at some moss which covered the surface of a chalk rock in this neighbourhood, and discovered that it was full of the larvæ of a *Scoparia*. I peeled a piece off, and found full-fed larvæ; and not only these, but pupæ. This somewhat surprised me, and, thinking they might prove something new, I collected a good many; the spot, however, on which they occurred was rather inaccessible of approach, and, getting somewhat too eager, considering the slippery state of the ground (it was a partial thaw), I came down much faster than I went up, and in so doing upset my box of pupæ. I did not feel inclined to climb again that day, and so, picking up myself and as many of my prizes as I could find, I wended my way homewards.

Thinking the matter over, I came to the conclusion that I had got *Scoparia dubitalis*, which is very common everywhere here, and so placed the pill-box containing my remaining pupæ in my breeding-room. Happening to look into this box, on the 20th of March, I was much surprised to find all of them had produced imagines of *S. angustea*, apparently some time back, as they were dead. As soon as I got an opportunity I went to the locality for more (on March 24th), but found that the majority had emerged, and I was only able to procure about a dozen: these came out by the end of the month.

On August 13th I again visited the locality, and found full-fed larvæ, pupæ, and one imagine. From the pupæ taken on that day I bred, during the month, a long and fine series. It is thus conclusively proved that in this locality, at any rate, the species is double-brooded.

The variation in the time of emergence in different localities is most strange. Mr. Porritt gets the single brood at Huddersfield late in July and early in August, within a week of the date when the second brood appears here. Mr. Fletcher gets his single brood in October. Again, Mr. Barrett bred several specimens of the first brood in May at Plymouth, which one would expect to be as early a locality as any in the British Isles; and yet in this district, in an exposed situation facing the

north-east, I find the insect in March, and I am disposed to think that, in favourable seasons, it would emerge as early as February.

The two broods vary considerably in appearance and habits. The March brood is much smaller, the ground colour paler, and the fascia more strongly delineated than those appearing in August. The second brood is also much more active than the first; in fact they are the most torpid and sluggish insects I have ever seen, so unlike all others of the group, which are noted for their activity.

It would be interesting to hear from others their experience of the time of appearance of this species. From the retiring habits of the early brood and the time of the year at which it emerges, I am disposed to think it has been overlooked in many localities, and would turn up if sought for at the proper period.

Rose Cottage, Oval Road, Addiscombe, Oct. 17, 1887.

A RATIONAL METHOD OF SETTING THE UNDER SIDES OF RHOPALOCERA.

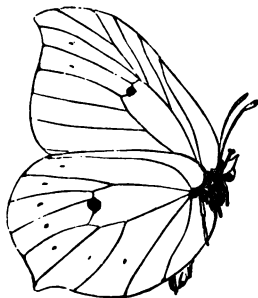
By PERCY RENDALL, M.D.

I HAVE been wishing for some years past to bring prominently before the large section of entomologists, that can be reached through the columns of this Journal, the following suggestions on the subject of exhibiting the under sides of Rhopalocera.

When collectors wish to display the under side of a butterfly the insect is turned upside down, violence is offered to Nature, and the artistic effect is destroyed. A pin is too often stuck through its thorax, and its legs, as if in protest against so unnatural a position, stray wildly in all directions in a distorted and quasi-epileptic fashion. The wings of an insect have a natural tendency to convexity, from the thorax to the tips; consequently when reversed they will be found to have a similar concavity in the same axial line, so that, when they dry, collectors with whom "setting is," judged not to be, "absolute waste of time and profitless labour" (Entom. 93), complain that the under sides of their butterflies "spring." What I suggest is this:—Take leaf out of Nature's book—set them, as they are so often seen

settled on a flower-head, and you will find that the beauty of their varied profiles will amply repay you.

The following practical hints may prove serviceable to any who care to give my method a trial:—Let the insect, with its wings closed over the thorax, lie upon your hand or upon a flat sheet of cork, and pass the pin through its body opposite the junction of all the principal nervures on the under surface of the hind wing, but take care not to interfere with the movements of the wing-joints. The pin should now be introduced so as to form rather more than a right angle with the wings, its head sloping slightly forwards; at least one-third of the pin should project below the insect's body, in order that when placed in the collection it may be well above the paper. This is a precaution that I adopt with all my insects, otherwise the specimens simply provide meals gratis for all passing mites, who soon discover that they can get refreshment by merely standing on their hind legs, whereas my experience is that they do not climb much, but live chiefly on ground-game! I then place the insect flat, upon a relatively large board, with its wings towards the groove, and by that means I have the slope of the board to neutralise the thickness of the body, and thus get the wings flat. It is necessary in pinning the insect on to the board to be careful not to exaggerate the obtuse angle that the pin forms with the wings, otherwise the cilia of the upper pair do not cover those of the lower, and its appearance is spoilt. Care must also be taken to arrange the wings so as to leave a distinct notch between the fore and hind pairs, and the antennæ should be fixed well in advance of the costa, and the legs closely adjusted to the sides of the thorax; the apex of the abdomen must also be drawn down and secured clear of the ventral borders of the hind wings, which are apt to conceal it. To fasten the wings, *in situ*, I always use strips of Silurian note-paper, broad enough to cover the outer-third of the wings.



GONEPTERYX RHAMNI.

The small size of the bodies of butterflies renders this way of setting them, in my opinion, both natural and satisfactory. It occurs to me, however, that some may instance the Hesperidæ as presenting special difficulties, owing to

the relative size of their bodies to their wings being so great; but a little practice, even with this family, will enable anyone, whose "fingers are not all thumbs," to overcome these drawbacks.

In conclusion, insects should of course be set so that male and female specimens face each other in the series.

The accompanying outline woodcut of *Gonepteryx rhamni* will serve to illustrate this particular method.

16, Little Grosvenor Street, W., October 14, 1887.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

VANESSA ANTIOPA AT BALHAM. — On August 6th last my brother and I had the pleasure of seeing *V. antiopa* near the railway station; it was only a few yards from us flying over a freshly watered road; its flight appeared quite different to any other of our native butterflies. It alternately fluttered and sailed over the road, and then turning sideways wheeled over some palings at a brisk rate and disappeared. It looked particularly dark and glossy in the bright sunlight, and the hind margins had a misty appearance. With regard to the colouring of the borders of *V. antiopa*, in my opinion the white border is due only to fading of the yellow, which colour is always present in all freshly emerged specimens; the white borders of those which have been taken in England seem towards proving that they are emigrants from other countries.—F. W. FROHAWK; Balham, S.W., November, 1887.

LYCÆNA CORYDON OCCURRING OFF THE CHALK.—A parallel case to that mentioned by Dr. Rendall (Entom. 229) occurs to me, and under somewhat similar conditions, viz., odd specimens of *L. corydon* and plenty of *Chrosis aleella* (*tesserana*), &c., occurring on the tertiary clay in Chattenden Woods, far removed from the usual haunts of these species. I think the answer lies in the fact that almost all the tertiary (Cainozoic) deposits of the London Basin, in Kent, Essex, Surrey, Middlesex, &c., lie on one or other of the cretaceous strata. In some cases the cretaceous strata are at a great depth below the surface, and the tertiaries are correspondingly thick; but where the tertiaries, owing to any cause (denudation or otherwise), are comparatively

thin, and the cretaceous very near the surface, the influence exerted on the flora must necessarily be very great. I think this is so in all cases where isolated specimens of a species, generally restricted to some particular soil, have been found in unlikely places. *L. corydon* has been taken in Epping Forest (Entom. xviii. 242; and Newman's 'British Butterflies,' p. 132); also at Barnes Common (Entom. xviii. 316). I dare say that many readers of the 'Entomologist' could cite other cases. These isolated specimens are generally fine, and probably fed very near the spot where captured, thus showing the existence of a partial cretaceous flora; but it seems that a specimen or two, by some means, must have settled there previously, otherwise where did the ova come from? It is, of course, next to impossible to show how such females have been introduced, whether for ages they have just managed to exist, or whether a female has wandered thither in comparatively recent times, and the progeny, finding the natural food-plants, have managed to get through life in a strange land and under new conditions. Newman, in his 'British Butterflies' (p. 132), gives an interesting instance of Mr. Harwood's, of the occurrence of *L. corydon* in the High Woods, near Colchester, which concludes as follows:—"There is no chalk anywhere in the district, and no marl within three or four miles of the High Woods."—J. W. TUTT; Rayleigh Villa, Blackheath, S.E.

LYCÆNA CORYDON AWAY FROM CHALK.—On the 10th August last, a friend captured this butterfly at Groombridge, on the embankment close to the railway station. I was with him at the time, and shortly afterwards took a specimen near the same spot. Later we were collecting on Broadwater Common, a few miles from Groombridge, when he captured another flying amongst heather. Our three were all males, and very fresh in condition. At Groombridge there is no chalk whatever, nor is the soil inclined to be chalky in the least for miles around. I have never noticed this butterfly in the locality before this summer, nor can I find out from anyone that it has ever been taken there before.—W. H. BLABER; Lindfield, Sussex, October 31, 1887.

DWARF FORMS OF LYCÆNIDÆ.—With reference to the note of Mr. Gush (Entom. 266), is it not more than probable that the dwarf forms of *Lycæna corydon* are the result of larvæ having had insufficient or not sufficiently nutritious food? I have some

pigmy specimens of *L. corydon* from the Dover cliffs, smaller than many *L. icarus*. There the food-plant is spread over a wide area, sometimes growing luxuriantly in protected hollows, at others growing very sparsely on the exposed cliffs. I have always considered the small dwarf specimens as having probably suffered from lack of food in the larval state, and, as a matter of fact, often find them in the more exposed situations, especially when freshly emerged. I have specimens of *L. bellargus* probably not larger than my largest *L. minima*, which I have always supposed were dwarfed in the same way. I dare say Mr. Gush would find dwarf specimens every year; I have seen them now, without exception, for many years successively at Dover. All the genus seems especially liable to this peculiarity in a state of nature. I have some very small *L. icarus* captured flying among a large number of normal-sized males. *L. medon* varies very much in the same direction.—J. W. TUTT.

SPHINX CONVULVULI.—The following are additional records:—

Scotland.—I have to record the capture of two specimens, and also one of *Acherontia atropos*, in this district, during the month of September.—W. PRINGLE; 168, Croft St., Galashiels.

Lancashire.—I have had brought to me three specimens, all very much worn. I also took one *Chærocampa celerio*, but unfortunately let it escape.—H. MURRAY; Lowbank Villas, Carnforth.

Cambridgeshire.—I captured three specimens after the 3rd of September in a garden, where, in 1885, I captured eleven. I have no doubt had I been able to look after them earlier this year I should have taken a great many more. I have taken them, without exception, flying at the flowers of the tobacco plant, which proves a great attraction for moths, especially hawk-moths, right on up to the end of October. Besides these *S. convulvuli* I have heard of several others being seen or taken in the district.—WM. FARREN, jun.; 14, King's Parade, Cambridge.

Surrey.—A specimen was captured flying during the daytime in Battersea Park Road, on the 6th of September.—T. SUTTON. I took one specimen flying in a garden at dusk about September 12th. I have heard of another which was bred from a larva found feeding upon the common bindweed two years ago.—H. M. LEE; Gladstone House, Sutton.

Hampshire.—During September I captured, early in the morning, eight specimens, and saw several others. It appeared

to have been common here. I have never taken it before in this locality.—L. MESSEL; Beachfield, Sandown, Isle of Wight.

The Lincolnshire specimens of *Sphinx convolvuli* (Entom. 303) were recorded by C. K. TERO, not C. R. Low.

CATOCALA FRAXINI IN SURREY.—I captured a specimen of this insect upon a tarred paling on September 18th. It is the first I have heard of being taken in the neighbourhood.—H. M. LEE; Gladstone House, Sutton, Surrey.

DICRANURA BICUSPIS, &C., AT TILGATE.—I took a trip to Tilgate Forest on September 3rd, to try if the larvæ of *Dicranura bicuspis* could not be beaten, and was fortunate enough to procure a full-fed one, which I thrashed out of alder. It refused to feed in confinement, and after wandering about in the breeding-cage for five days condescended to spin a cocoon on a piece of bark which I had introduced to it for that purpose. The figure in Buckler's 'Larvæ' is very good, in fact unmistakable. The usual autumnal larvæ were fairly plentiful, and a considerable number of such species as *Cymatophora fluctuosa*, *Acronycta leporina*, *Ypsipites impluviata*, *Notodonta dictæoides*, *N. dromedarius*, *Geometra papilionaria*, &c., fell to the beating-stick.—W. G. SHELDON; Rose Cottage, Oval Road, Addiscombe, October 17, 1887.

RETARDED EMERGENCE OF LOPHOPTERYX CUCULLA.—Last autumn a friend kindly sent me a few of these larvæ, which I fed up on sycamore leaves, and which in due time pupated. All but three came out in perfect form between June 5th and 21st. On the 3rd of this month, on looking into my breeding-cage, I saw a moth fluttering about, and, to my surprise, found it to be a perfect specimen of *L. cuculla*. I suppose this is a very unusual occurrence; and what puzzles me is whether it is a retarded emergence, or a very early one of a second year's pupation.—J. SEYMOUR ST. JOHN; Chalfont St. Peter, Slough, September 12, 1887.

CATEPHIA ALCHYMISTA.—Mr. Tutt (Entom. 306) mentions the capture of two specimens of this species in Britain. A third specimen was caught at "sugar" by Mr. W. Borrer, jun., near Hailsham, Sussex, on the night of the 4th June, 1875. I was staying at Hailsham at the time, and saw the specimen soon after its capture.—H. Goss; Surbiton Hill, November, 1887.

THE TEPHROSIA QUESTION.—In June last I sent a few notes concerning *Tephrosia crepuscularia* or *biundularia* larvæ (Entom. 159), and I would now add that these larvæ were fed from first to last on the blackthorn, and their resemblance often to the twigs was very striking. They varied in shades of colour according to age, from pale brown to almost black, some of the same stage of growth differing in this way. Leaving the neighbourhood the second week in June, I left them with an entomological friend, who took careful note of them. They commenced to turn to pupæ on June 21st, and the imagines began to appear on July 7th. All the examples were diminutive in size compared with the early brood and very similar in colouring, there being only two forms, one with the ground-colour white, the other brown. The transverse markings are alike in each, being delicately defined as in those of the late examples of the first brood, which usually appear at the end of April and in May. Five pupæ did not emerge, and I have them apparently living still.—T. B. JEFFERYS; Clevedon, October 19, 1887.

ACIPTILIA PALUDUM, Zell.—This delicate and pretty little plume-moth has again occurred here during the past season. I understand that the Rev. Charles Digby has also again met with it near Studland, and Mr. Eustace Bankes has found it near Corfe Castle; so that it is probable that it will in future be found, if worked for, on most of our heathy bogs. All our efforts to find the larvæ have failed; it would, however, appear to be double-brooded, as I found several in fine condition on the 14th and 16th of June. Thinking that these would be the progenitors of a second brood, I refrained from taking more than the few above noted. The first met with of this latter brood occurred on August 4th, and the last seen was on the 27th. Although on some of our finest and quietest evenings in August scarcely an individual was seen, it did not hesitate occasionally to fly briskly in the full blaze of a hot sun. A moderately dewy evening appears to draw this little moth out most freely, and the evenings of last August were remarkable for an almost total absence of dew.—O. P. CAMBRIDGE; Bloxworth Rectory, Dorset, October 4, 1887.

CANNIBALISM AMONG EUPITHECIE LARVÆ.—Having collected some larvæ of *E. coronata* in South Wales (among which there happened to be one of a *Noctua* larva), I was surprised one

morning to find that about six of the *coronata* larvæ had completely devoured the *Noctua* larva, which was about three times the size of the former. I was aware of cannibalism existing among the larvæ of *E. minutata*, but have hitherto not been acquainted with it in the case of *E. coronata*.—J. JAGER; 180, Kensington Park Road, Notting Hill, September 15, 1887.

LARVA RAPIDLY CHANGING COLOUR? — Mr. Hambrough's query as to larva changing colour (Entom. 284) may probably be accounted for by the common fact in optics, that blue or purple is the complementary colour to yellow or orange; therefore a fixed gaze for a minute or so upon the marigold and then upon a neutral-tinted object, like the larva, the latter would be sure to assume for a few seconds a blue or purple tinge. I never heard of larvæ changing colour spontaneously, and believe this explanation will easily account for it.—E. WHEELER; 31, Triangle, Clifton, November 5, 1887.

THE HESSIAN FLY PREVIOUSLY IN GREAT BRITAIN.—In the report of the October meeting of the Entomological Society of London (Entom. 309), I notice that Prof. Riley was of opinion that the *Hessian Fly* was of recent introduction into our island, and strengthened his opinion by remarking that it "had not been recorded by Sir Joseph Banks, Curtis, Prof. Westwood, the late Mr. Kirby, or by any other entomologist in this country who had given especial attention to economic entomology," &c. The founder of this Magazine had, however, noticed it at least eleven years ago, for in the 'Entomologist,' under date February, 1876, he writes:—"I trust the mischief (some linen damaged by *Arctia fuliginosa* larvæ) may not occur again; as in the case of the yellow-tail moth, the *Hessian fly*, and various other insects which have seemed to threaten a continuous loss, and from time to time have elicited prophecies of famine, which happily still await fulfilment, this visit of the ruby tiger may possibly never recur. Sincerely hoping this may be the case, I must content myself with . . . continuing to give this subject my best and most unremitting attention.—EDWARD NEWMAN." The italicised clauses will serve to make this plainer.—E. G. BAYFORD; West Melton, near Rotherham, November 4, 1887.

ACANTHOCINUS CÆDILIS.—A few days ago a fine male of this species was taken, flying across the packing-room of a Bolton cotton-mill; and, although inquiries were made, no new timber

could be heard of as having come into the neighbourhood lately. It probably came in the egg state. About three years ago one of the same species was captured down a coal-pit, having evidently got there with timber for propping purposes.—E. STOTT; Lostock, Bolton, October 31, 1887.

ENTOMOLOGICAL COLLECTIONS.—I have read with considerable interest this discussion which is being carried on in the pages of the 'Entomologist,' and am gratified to find that the subject has been so carefully and thoroughly studied. I perfectly agree with Mr. Tutt, as far as the study of physics, biology, and mathematics being of more educational value than Entomology, but I most decidedly differ from him when he states that the study of Natural History taken as a whole is of more educational value than the study of any one of its divisions. I firmly believe that more has been done to retard the progress of Natural History by people who profess to have grasped the whole subject, than by any other cause. It is such men as these who are so ready to make "new and distinct species." I hold that no man can thoroughly grasp the whole of Natural History, and that if every naturalist was to devote himself to that group (the smaller the better) to which he was most attached we should have a much more satisfactory and reliable classification, and more knowledge towards the advancement and perfection of the science than we have at present. There are two kinds of education: the first, where one learns for his or her own benefit and interests; the second, where one learns that he may impart his knowledge to others. Now everyone will admit that this latter must be the more complete and thorough of the two. I understand Mr. Tutt to argue that one ought to take the whole subject of Natural History to derive an educational result, but I would ask him one question: What benefit to the naturalists at large would be the knowledge of a man who only knew his study imperfectly? As I remarked above, it is impossible for one individual to embrace the whole subject so thoroughly well, as to be enabled to render material help. What we really require is men who will be content to work at one group, and each to study the classification of his particular branch as thoroughly as he is able. Then, when these several arrangements are obtained, and *classified* under the one heading of Natural History, we may hope
a more satisfactory and trustworthy result than at present,

but not before. There is one other point in Mr. Tutt's article to which I should like to call attention, and that is the setting of entomological specimens. From a purely scientific point of view I am convinced that it is unnecessary, but I think that, if the specimens are to be preserved, we ought at least to pay some little attention to the fact that after taking life for the advancement of Science, we ought to make the object as pleasing to the eye as we are conveniently able. The non-setting of specimens would be very convenient to those who will not be at the trouble to master good setting; and I know too well, from experience, how long that takes to learn.—A. E. HALL; Norbury, Pitsmoor, Sheffield, October, 1886.

ENTOMOLOGICAL COLLECTIONS.—I suppose that few, if any, collectors would say that they set their insects either for pleasure or recreation, and it may be that Mr. Tutt is right in considering setting unnecessary when they are required for purposes of classification and reference only. On the other hand, if the specimen is to be "a thing of beauty," in order to be "a joy for ever" it is imperative that it should be properly preserved. To this end all due regard must be paid to the symmetrical disposal of the wings, the antennæ must be placed in proper position, the body brought up to the right level, and not a scale ought to be removed. For my own part I would rather possess one good, well-set specimen, than half a dozen indifferent ones, rare or common; in fact, my aim has always been to get together not a large series, but each insect absolutely perfect. Perhaps the following suggestion may be feasible. It is that unset specimens should be employed by entomologists desiring an exchange for scientific purposes alone. This to be stated on both sides, preliminarily, of course, or much disappointment and annoyance might ensue. Such an arrangement might save a good deal of trouble to persons not particular about having set insects. It seems strange that any apology should be thought needful for those who devote their time or leisure to the study of insect life, or even collecting specimens of whatever order it may be. The idea never appears to suggest itself in the case of the botanist, geologist, or conchologist. But it is no new thing; as the case of the noble lady in whose honour the name of our fritillaries was given will testify, and who was supposed to be incompetent of

making a will because of her love for entomological pursuits. All these objectors have been fully answered by those renowned entomologists Messrs. Kirby and Spence, and I would refer all in doubt about the utility of the study of insects to that able and instructive work the 'Introduction to Entomology.' And, by the way, could not some entomologist undertake the compilation of an index to the work, with a view to a new edition, thereby enhancing the value of an almost invaluable book ten-fold?—JOSEPH ANDERSON, Jun.; Chichester.

NIGHTJAR FOLLOWING MOTHS INTO HOUSE.—While taking moths by the light of the gas in my room on the 2nd of August last, I received a visit from a nightjar, *via* the open window. The bird was so frightened at falling into the hands of such an enemy as an entomologist, that he would scarcely believe his good luck when I let him fly the next morning, and took ten minutes to consider whether or not he had forgotten how to do so.—(Miss) K. DINGWALL; Knollys Croft, Leigham Court Road, Streatham, S.W.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*November 2nd, 1887.* Dr. David Sharp, F.Z.S., President in the chair. Mr. Stevens exhibited a specimen of *Acidalia immorata*, L., purchased by him some years ago at the sale of the collection of the late Mr. Desvignes. Mr. Stevens remarked that specimens of the insect lately captured near Lewes had been described last month by Mr. J. H. A. Jenner as a species new to Britain. Mr. Adkin exhibited, and made remarks on, a series of male and female specimens of *Arctia mendica* from Co. Cork; he also exhibited for comparison two specimens of *A. mendica* from Antrim, and a series of bred specimens from the London district. Some of the males from Cork were as white as the typical English females, but the majority of them were intermediate between the form last mentioned and the typical English form of the male. Mr. Enock exhibited a specimen of *Calocoris bipunctatus* containing an internal parasitic larva. Dr. Sharp exhibited three species of *Coleoptera* new to the British list, viz.: (1) *Oethebius auriculatus*, Rey, found by Messrs. Champion and Walker some years

ago in the Isle of Sheppey, but described only quite recently by M. Rey from specimens found at Calais and Dieppe. (2) *Limnius rivularis*, Rosenh., found by the late Dr. J. A. Power at Woking; the species, though not uncommon in Southern Europe, had not, he believed, been previously found farther north than Central France. (3) *Tropiphorus obtusus*, Bonsd., taken by himself on the banks of the Water of Cairn, Dumfriesshire; he had considered previously that this might be the male of *T. mercurialis*, but M. Fauvel, who was studying the European species of the genus, informed him that this was not the case. Dr. Sharp also exhibited a *Goliathus* recently described by Dr. O. Nickerl as a new species under the name of *Goliathus atlas*, and remarked that the species existed in several collections, and had been supposed to be possibly a hybrid between *G. regius* and *G. cacticus*, as its characters appeared to be exactly intermediate. He also exhibited a living example of the Mole Cricket, *Gryllotalpa vulgaris*, from Southampton; between the spines of its hind legs were a number of living Acaridæ placed in a symmetrical manner so as to appear as if they formed a portion of the structure of the limb. Mr. Eland Shaw exhibited two species of Orthoptera, which had been unusually abundant this year, viz. *Nemobius sylvestris*, from the New Forest, and *Tettix subulatus*, from Charmouth, Dorset. Mr. E. B. Poulton exhibited the cocoons of three species of Lepidoptera, in which the colour of the silk had been controlled by the use of appropriate colours in the larval environment at the time of spinning up. Mr. Poulton said this colour susceptibility had been previously proved by him in 1886 in the case of *Saturnia carпинi*, and the experiments on the subject had been described in the Proc. Royal Society, 1887. It appeared from these experiments that the cocoons were dark brown when the larvæ had been placed in a black bag; white when they had been freely exposed to light with white surfaces in the immediate neighbourhood. Mr. Poulton stated that two other species subjected to experiment during the past season afforded confirmatory results. Thus the mature larvæ of *Eriogaster lanestris* had been exposed to white surroundings by the Rev. W. J. H. Newman, and cream-coloured cocoons were produced in all cases; whilst two or three hundred larvæ from the same company spun the ordinary dark brown cocoons among the leaves of the food-plant. In the latter case the green surround-

ings appeared to act as a stimulus to the production of a colour which corresponded with that which the leaves would subsequently assume. Mr. Poulton further stated that he had more recently exposed the larvæ of *Halias prasinana* to white surroundings, and had obtained a white and a very light yellow cocoon—far lighter than the lightest of those met with upon leaves. The larva which spun the white cocoon had previously begun to spin a brown one upon a leaf, but upon being removed to white surroundings it produced white silk. Mr. Stainton suggested that larvæ should be placed in green boxes, with the view of ascertaining whether the cocoons would be green. He understood that it had been suggested that the cocoons formed amongst leaves became brown because the larvæ knew what colour the leaves would ultimately become. Mr. Poulton said he felt convinced that the whole process was entirely involuntary, and that the susceptibility had arisen through the action of natural selection. The discussion was continued by Mr. Waterhouse, Dr. Sharp, Mr. McLachlan, and others. Mr. Klein read "Notes on *Ephestia kuhniella*," and exhibited a number of living larvæ of the species, which he said had been recently doing great damage to flour in a warehouse in the East of London. Mr. A. G. Butler contributed a paper "On the species of the Lepidopterous genus *Euchromia*; with descriptions of new species in the collection of the British Museum." Lord Walsingham communicated a note substituting the generic name *Homonymus* for the generic name *Ankistrophorus*,—which was preoccupied,—used in his "Revision of the genera *Acrolophus* and *Anaphora*," recently published by the Society. Mr. Waterhouse announced that at the December meeting he would exhibit a series of diagrams of wings of insects, and make some observations on the homologies of the veins.—H. Goss, *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—October 27th, 1887. R. Adkin, Esq., F.E.S., President, in the chair. Messrs. C. E. M. Ince and W. H. B. Fletcher, M.A., were elected members of the Society. Mr. C. A. Briggs exhibited dwarfed forms and varieties of *Lycæna corydon*, taken this year. Mr. C. E. M. Ince, a variety of the underside of *Argynnis paphia*, having a black blotch on the centre of the left superior wing. Mr. Sheldon, living larvæ of *Eupithecia expalli-*

data, and *Aphomia sociella*; and a discussion ensued as to the hibernation of this species in the larval stage. Mr. Tutt, a cocoon of *Saturnia pavonia*, having two exits, there being only one pupa inside. Mr. Tutt stated that Mr. Clark, of Hackney, had met with a similar pupa of *Bombyx trifolii*. Mr. Robinson, who was present as a visitor, *Tapinostola fulva*, *Plusia chryson*, and a specimen of *Noctua*, which was said to be probably a variety of *Orthosia upsilon*, Borh. Mr. R. South said, that after a close examination of the specimen of *Zygæna loniceræ*, with apparently four antennæ, exhibited at the last meeting, he had found Mr. Tugwell's suggestion that the extra pair was simply the pupa-cases of the antennæ was correct, the only parts of the insect free of the pupa-case being the legs and antennæ. Mr. S. Adkin read "Notes on Collecting at Eastbourne during August and part of September." At the close of the paper a discussion took place, in which Messrs. J. J. Weir, Sheldon, Tutt, Cooper, Carrington, Tugwell, Wellman, and Billups took part.

Nov. 10th, 1887. The President in the chair. Messrs. A. M. Keay, J. H. A. Jenner, and A. Robinson were elected members. Mr. J. A. Cooper exhibited a curious form of *Hadena dentina*, red forms of *Noctua glareosa*, and *N. castanea*; also a series of *Tephrosia biundularia*, from Derby. Mr. Oldham, a strongly marked variety of *Noctua baia*. Mr. Tugwell, English, Scotch, and Irish forms of *Boarmia repandata*. M. J. A. Clark, bred specimens of *Polyommatus phleas*, with preserved larvæ, and contributed notes. Mr. Goldthwaite, bred *Pericallia syringaria*. Mr. Mera, varieties of *Arctia caia*, bred from ova hatched in June. Mr. Kenward, varieties of *A. caia*, one specimen having yellow hind wings. Mr. H. H. Druce, a melanic variety of *Vanessa urtica*, taken at Mexico. Mr. Sheldon, a series of about twenty-five *Tephrosia biundularia*, from Derbyshire, and contributed notes. Mr. Tutt, specimens of *Dianthæcia compta*, from Germany, and a variety of *D. nana*, closely approaching *D. compta*. Mr. West (Greenwich), *Dytiscus marginalis*, *D. circumflexus*, and *D. punctulatus*. Mr. Billups, *Astynomus œdilis*, from Chobham; *Strangalia aurulenta*, from Warnham, and *Nebria complanata*. Mr. Tutt read a paper on "Darwin's Theory of Hybridism and Mongrelization," which was followed by a long discussion in which Messrs. Jenner Weir, Carrington, and others took part.

November 16th. *Annual Exhibition.*—The Exhibition was held at the Bridge House Hotel, and notwithstanding the dense fog which prevailed was attended by about 1000 persons. There were exhibits in all branches of Natural History, and during the evening the Sciopticon Company gave two displays of photomicrographs by the Sciopticon lantern. Among the principal entomological exhibits were those of Mr. R. McLachlan, European Trichoptera, Ant-lions, Ascalaphus, Nemopteridæ, &c., and European Psocidæ. Mr. S. L. Mosley, cases showing the life-history of the Hessian Fly, *Cecidomyia destructor*, &c.; Orthoptera by Mr. Eland Shaw and Dr. Sequeira; Exotic Coleoptera by Mr. F. Grut and Mr. Epps, the latter showing a box of the West Indian and South American weevils which attack the cocoa-bean (*Theobroma cacao*), British Coleoptera being represented by Mr. T. R. Billups' collection, contained in sixteen drawers, and by Mr. Cripps, Mr. G. A. Lewcock showing the Donacia and Longicornia, Messrs. C. H. Morris and J. H. A. Jenner also exhibiting in this order. Diptera, Hemiptera and Hymenoptera were also shown by Messrs. Billups and Jenner. Mr. Bignell, an interesting case of galls. In the Lepidoptera the exhibits were more numerous, exotic species being exhibited by Messrs. J. Jenner Weir, S. Edwards, E. Cooke, Frohawk, Dannatt, Malyon, and the Zoological Society of London, the last-named with specimens reared in the Insect House in the Society's Gardens. Among the British Lepidoptera were the exhibits of Mr. Elisha, twenty drawers containing his collection of Tortrices, Tineæ and Pterophori, a most interesting show. Mr. Adkin, a long series of the white form of the male of *Spilosoma mendica*; also *Ephestia kuhniella*, with flour affected by the larvæ of this species. The genus *Lycæna* was represented by the exhibits of Messrs. C. A. Briggs, A. B. Farn, T. W. Hall. E. Sabine, R. South, S. Webb, and others, Mr. A. H. Jones exhibiting two drawers of European species. The whole formed a most interesting exhibit, and it is not often that such a collection of forms and varieties of this genus can be seen together. Mr. Sabine's box attracted much attention. Mr. J. A. Clark, a most interesting case of *Zeuzera pyrina* (*æsculi*) containing many good varieties; also two drawers from his fine collection. Mr. J. A. Cooper and Mr. S. Stevens showed their collections of Rhopalocera, the latter gentleman's containing a number of varieties and the specimen of *Melitæa eos* taken in

1802. Mr. Machin, a fine drawer of *Peronea hastiana* and *P. cristana*, principally the latter. Dr. Sequeira, a case of insects taken in his garden at Hackney. Mr. C. H. Morris, *Acidalia immorata*, &c. Mr. Boden, a pocket box of Micro-Lepidoptera, containing many rare species and varieties, the most interesting being a variety of *Ennychia octomaculata*, and a species which was not identified. Mr. South, comparative series of *Noctua brunnea* and *N. festiva*, including var. *conflua* from various localities, and a case of *Boarmia repandata* from many localities, including all the named varieties. Mr. Tutt, comparative series of Agrotidæ and European Zygænidæ. Mr. Howard Vaughan, two drawers of *Cidaria truncata* and *C. immanata*. Mr. Eedle, life-histories, the larvæ being mounted on the natural food-plants. Mr. Jager, *Callimorpha hera*, &c. Mr. Tugwell, his collection of Noctuæ. Mr. Wellman, three broods of *Acidalia rubricata*, many species of Pterophoridæ, &c. Mr. C. H. Williams, a case of preserved larvæ. Mr. G. Baker, larvæ and imagos of *Eupithecia venosata*, *E. satyrata*, *E. curzoni* and *E. nanata*. Mr. R. E. Salwey and Mr. Blackall, many interesting series of Macro- and Micro-Lepidoptera. Among the other exhibitors in this order were Mrs. Hutchinson, Messrs. Barren, Croker, Dobson, Druce, Goldthwaite, Helps, Jenner, Joy, Lamplough, Levett, P. Russ, Stringer, Dr. Rendall, &c. Messrs. Neighbour and Son exhibited bee-keeping appliances, and there was a good display of microscopic objects, the Society being assisted by the Quekett, South London, and Hackney Microscopical Societies.—H. W. BARKER, *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—The first conversazione and exhibition of objects of entomological interest was held by this Society on Monday, October 31st, in the Society's meeting-room, in the free library, William Brown Street, Liverpool. The number of members and friends was very satisfactory, there being over one hundred present. The President, Mr. S. J. Capper, F.L.S., delivered an address explaining the aim and object of this Society. Having alluded to the library of the Society, he advocated the placing of type collections of insects, such as his own educational collection, in all our schools, so that children might be taught to take an intelligent interest in our insect fauna. Mr. C. H. Walker delivered a lecture on

"Ten Minutes dabbling in a Stagnant Pool," giving an account of its insect inhabitants, their habits and transformation. Dr. J. W. Ellis gave a sketch-lecture on "The Mouths of Insects," comparing the mouth-parts of a bee, a beetle, and a butterfly. On the tables were placed a number of interesting exhibits. By the President, Mr. S. J. Capper, five drawers forming an educational collection of insects, and a drawer of *Lycænide* containing extraordinary varieties of the under sides. The Rev. H. H. Higgins, British *Syrphidæ*. Mr. C. S. Gregson, two drawers of varieties of *Abraxas grossulariata*; these drawers excited great attention, being said to have been picked from over a hundred thousand bred by the exhibitor. Mr. F. N. Pierce, a drawer showing various modes of setting, and a selection of British *Lepidoptera* showing the larva and perfect insect of each species; also a case showing Irish cream-coloured *Arctia mendica*, compared with the ordinary form; and a series of several species showing range variation. Dr. W. J. Ellis, British *Lamellicornes* and *Chrysomelidæ*; in the latter drawer was a full series of *Chrysomela cerealis* taken by himself on Snowdon. The Hon. Secretary, Mr. R. Wilding, drawers of British *Coleoptera*; this exhibit was greatly admired for the exceedingly neat way in which the beetles were arranged, and as containing many rare species. By the courtesy of the Rev. H. H. Higgins and Mr. T. J. Moore, selections from the British and European collections of *Lepidoptera* bequeathed to the city by the late Nicholas Cooke. Mr. W. Johnson, a drawer from his cabinet containing the genus *Lithosia*, and some good varieties of *Arctia caia*; also boxes containing specimens of all species in the genus *Plusia* and *Dianthæcia*. Mr. R. W. Hughes, a drawer containing representatives of insects captured during the year around the district of Liverpool. Mr. C. H. H. Walker had beautiful illustrations of insects taken from life, drawn by himself. Mr. J. Mackintosh, curious old entomological books; while round the room were distributed various apparatus useful in the collection and preservation of insects, exhibited by B. Cooke and Son, of Liverpool. Microscopes were exhibited by Mr. J. C. Thompson and other members.—F. N. PIERCE.

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